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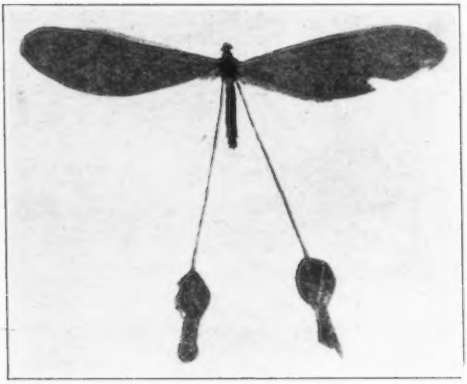

Halter americana Cockerell.

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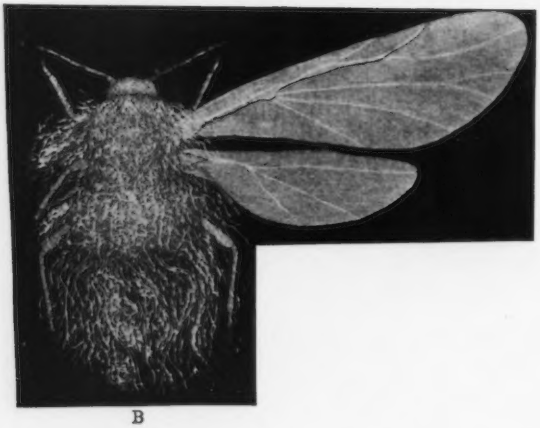

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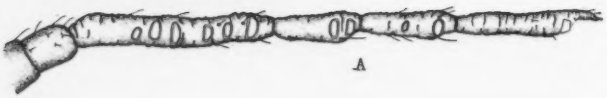

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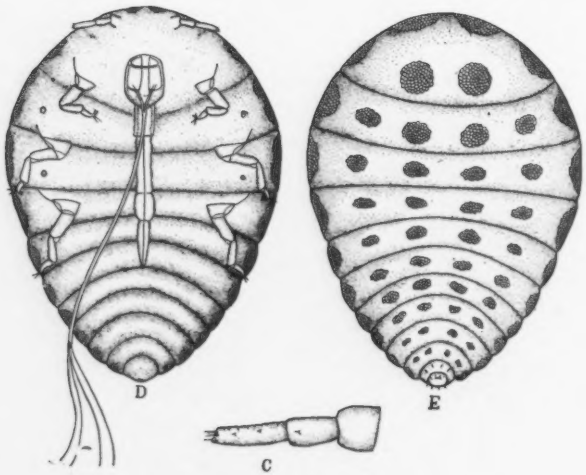

D E C

SCHIZONEURA POPULI N. SP.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIX. JANUARY, 1908. NO. 1.

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The Poplar Bark Aphid (Schizoneura populi n. sp.)

C. P. GILLETTE.

(Plate I)

I have noticed a pale yellow schizoneuran infesting the crevices in the bark of trunks and limbs of the native narrow-leaved cottonwood, the broad-leaved poplar, the Carolina poplar, and the balm of Gilead, for several years upon the Western Slope, in Colorado. I have noted the louse as specially numerous at Grand Junction, Delta, Paonia and Montrose.

The white cottony secretion often fills nearly all of the crevices in the bark and it remains throughout the year, hiding the lice and their eggs.

On June 14th, of last year, Mr. E. P. Taylor told me of finding one of the winged lice, and two days later I collected a good number lodged upon Mr. Taylor's porch screen, there being some badly infested balm of Gilead trees in front of the house. At this time eggs and young were very numerous Mr. Taylor noted the appearance of winged lice for about two weeks, when they disappeared for the remainder of the summer. As fast as winged lice appeared they left the trees, but I have not been able to get any clue as to where they go.

I attempted to get them to locate upon cottonwood twigs by inclosing them with twigs in a breeding cage, but without success.

While it seems probable that the winged migrants establish new colonies somewhere, perhaps upon some different food plant, it is also certain, as in the case of *Chermes coloradensis*, that some of the apterous females live over winter upon the trees, for bark which I removed January 29th, at Grand Junction, was found to have living lice and some eggs. These eggs I was able to hatch in the laboratory, and the young established themselves upon cottonwood twigs that were furnished them and did well. When very numerous, the lice often cause rough, knot-like growths of trunk or branches, much as in the case of *Schizoneura lanigera* of the apple.

The Eggs.—The eggs are very pale straw yellow, much lighter than any of the *Chermes* eggs I have seen, and are .023 mm. in length by .014 mm. in width. The eggs are not attached but simply entangled by the cottony secretion.

Young.—The newly hatched young are like the eggs in general color, with legs, antennæ and distal end of the long beak dusky, and the eyes bright red.

Adult Apterous Female.—The adult apterous females are also very light yellow in color, the older individuals being the darker. Large females measure approximately .8 mm. long by .6 mm. broad. The size and arrangement of the wax glands or plates are best indicated in the drawing, Plate I, Figs. D and E. The only plates showing on the ventral surface are the marginal ones, while dorsally all the longitudinal rows extend continuously to the eighth abdominal segment. At least they can be so traced in some individuals. The beak is peculiar, in that it may be extended so as to attain, or even surpass, the tip of the abdomen, when it appears to be four-jointed. The rather long basal piece seems to serve as a tube into which the next joint, the real first joint, composed of seven or eight serial pieces, as shown in the figure, may be telescoped. The two distal joints are both quite short. From specimens taken June 16th, and December 12th, 1906, at Grand Junction.

Winged Female.—Length of fore-wing, 3.50 to 3.75 mm.;

hind-wing, 2.35 to 2.75 mm. Length of body, 1½ to 2 mm. Antennæ, 6-jointed, length, .8 mm. Joints 1 and 2, short and stout, the 2nd a little longer than broad; 3rd, longest, equaling 4th and 5th together; 5th, a trifle longer than 4th; and 6th, distinctly longer than 5th. The proportions of the 4 distal joints are about as follows: 21, 9, 11, 15. Total length of antenna a little less than one-half length of body. Compound eyes, ocelli, abdomen, tips of tarsi and antennæ, and more or less of the thorax above, dusky to black, otherwise pale yellow. The anterior wing has a very distinct, though narrow, black line extending from the base along the subcostal nerve, but a little beneath it and terminating on the costal margin just beyond the stigma. A similar black line starts on the anal margin of the hind-wing close to the body and extends forward and outward to meet the costal nerve and then turns at an acute angle back to the costal margin close to the body. Body and wings are powdered with a white secretion and from thorax and abdomen a white waxy secretion forms in long, slender threads, nearly or quite hiding the body. Antennal spur of 6th joint not over 1-5 length of joint and with a large sensorium at its base, also large oval sensoria near distal ends of joints 4 and 5, and along the underside of joint 3, where there are about 6.

Described from specimens taken at Grand Junction, Colorado, June 16th, 1907.

DESCRIPTION OF PLATE I.

Plate I, *Schizoneura populi.*—A, antenna of alate female × 100; B, winged female × 70; C, antenna of apterous female × 280; D and E, ventral and dorsal views of adult apterous female, showing arrangement of wax plates or glands × 70.

Miriam A. Palmer, artist.

EDITOR ENTOMOLOGICAL NEWS:—If Mr. W. E. Longley will look over the collection which I sold Field Columbian Museum, I think he will find a specimen of *Sesia titan* with label showing that it was taken at North Evanston, Ill., a little farther north than Oak Park. At least two examples of that species were taken there, but both worn, showing that they had probably traveled from a warmer climate.—ARTHUR J. SNYDER, Springfield, Idaho.

Standards of the Number of Eggs Laid by Insects—VI.*

Being averages obtained by actual count of the combined eggs from twenty (20) depositions or masses.

By A. Arsene Girault.

7. Culex restuans Theobald.

No.	Date, 1907	No. counted per mass	Successive totals	Av. per egg mass	Max.	Min.	Range	
1	July 12	244	244	244.			391	
2		298	542	271.				
3		157	699	233.		157		
4		278	977	288.5				
5	July 20	391	1368	273.6	391			
6		371	1739	289.8				
7		265	2004	286.2				
8		261	2265	283.1				
9	July 29	283	2548	283.1				
10		240	2788	278.8				
11		231	3019	274.4				
12		256	3275	272.9				
13		269	3544	272.6				
14	July 30	258	3802	271.5				
15		229	4031	268.7				
16		242	4273	267.				
17		279	4552	265.8				
18	July 31	258	4810	267.2				
19		245	5055	266.				
20		287	5342	267.1			159	
20			5342	267.1	391	157	234	Finals

The egg-masses were obtained at New Richmond, Ohio, during July, 1907, by exposing a large tub of water out of doors. Within a week afterwards, the water in the tub was literally alive with the young of *restuans*, and numerous egg-masses were found each morning floating on its surface. The great majority of the adults reared were captured and carefully examined, but during the month no other species made its appearance.

I am indebted to Mr. Frederick Knab, U. S. National Museum, for determination of the species.

* For the first five of these series, see Ent. News, 1901, p. 305; 1904, p. 2-3; 1905, p. 167; 1906, p. 6 and 1907, p. 89.

Notes on the Tipulid Genus Dicranomyia.

R. W. Doane, Stanford University.

TABLE FOR THE DETERMINATION OF THE SPECIES.*

(Based on Osten Sacken's table in Mon. N. A. Dip. Pt. 4.)

1. Wings remarkably narrow, lanceolate . . . . . **longipennis** Schum.
   Wings of the usual shape . . . . . 2.
2. Tip of the auxiliary vein nearly opposite, or before, or only a short distance beyond the origin of the praefurca . . . . . 3.
   Tip of the auxiliary vein a considerable distance beyond the origin of the praefurca . . . . . 31.
3. The whole antennae, or at least their basal joints pale . . . . . 4.
   The whole antennae black or brown . . . . . 13.
4. Discal cell open . . . . . 5.
   Discal cell closed . . . . . 7.
5. Thorax with a single brown stripe in the middle . . **immodesta** O. S.
   Thorax with three brown stripes . . . . . 6.
6. Tip of the auxiliary vein nearly opposite or only a little before the origin of the praefurca . . . . . **gladiator** O. S.
   Tip of the auxiliary vein a considerable distance before the origin of the praefurca . . . . . **cinerea** Doane.
7. Flagellum of the antennae not infuscated . . . . . **pudica** O. S.
   Flagellum of the antennae more or less infuscated . . . . . 8.
8. Knob of the halteres infuscated . . . . . 9.
   Knob of the halteres not infuscated . . . . . 11.
9. Subcostal cross-vein close to the tip of the auxiliary vein. **citrina** Doane.
   Subcostal cross-vein some distance from the tip of the auxiliary cross-vein . . . . . 10.
10. Halteres pale, knobs infuscated; abdomen brownish yellow. **isabellina** Doane.
    Halteres and abdomen infuscated . . . . . **diversa** O. S.
11. Brownish markings along some of the veins and in some of the cells. **marmorata** O. S.
    Wings hyaline . . . . . 12.
12. Body yellowish . . . . . **fulva** Doane.
    Body greenish . . . . . **viridicans** n. sp.
13. Discal cell (in normal specimens) open; tip of the auxiliary vein considerably anterior to the origin of the praefurca; the praefurca is about equal in length to the distance between the origin of the third vein and the small cross vein, or even shorter . . 14.
    Discal cell closed; tip of the auxiliary vein nearly opposite the origin of the praefurca (or, when anterior or posterior, the distance is small); praefurca distinctly longer than the distance between the origin of the third vein and the small cross vein . . . 18.

*I have not seen *D. chorea* Meig., and cannot from the description place it or *D. venusta* Berg. in the table. The latter is closely related to *D. simulans* Walk and *D. duplicata* Doane.

14. Rostrum and proboscis nearly as long as the head . **rostrifera** O. S.
Rostrum and proboscis much shorter than the head . . . . . 15.
15. Thorax brown . . . . . **floridana** O. S.
Thorax ochraceous . . . . . 16.
16. Thorax with a single broad brown stripe . . . . . **ochracea** Doane.
Thorax with three brown stripes . . . . . 17.
17. Stigma pale . . . . . **brevivena** O. S.
Stigma fuscous . . . . . **vulgata** Bery.
18. Thorax shining black, pleura with a silvery reflection.
morioides O. S.
Thorax brownish or grayish . . . . . 19.
19. Femora with a narrow pale band at the tip . . . . . 20.
Femora without such a band . . . . . 21.
20. Posterior margins of the segments of the abdomen lighter.
badia Walk.
Posterior margins of the segments of the abdomen not lighter.
adjecta n. sp.
21. The distance between the tip of the auxiliary vein and the subcostal cross-vein is nearly or quite as long as the stigma . . . . . 22.
The distance between the tip of the auxiliary vein and the subcostal cross-vein is shorter than one-half the length of the stigma . 27.
22. Halteres unusually long . . . . . 23.
Halteres of usual length . . . . . 24.
23. Thorax brown, stripes confluent . . . . . **halterata** O. S.
Thorax yellowish, three brown stripes . . . . . **particeps** n. sp.
24. Thorax yellowish . . . . . 25.
Thorax brownish . . . . . 26.
25. First segment of palpi yellow . . . . . **helva** Doane.
Palpi wholly brown . . . . . **gracilis** Doane.
26. Thorax with a narrow median lighter line . . . . . **brunnea** Doane.
Thorax with yellowish or brown stripes . . . . . **distanas** O. S.
27. The cross-vein separating the discal cell from the first basal cell is arcuated in such a manner that the inner end of the discal cell is but little more distant from the base of the wing than the inner end of the submarginal cell . . . . . **sulta** O. S.
This cross-vein not so arcuated . . . . . 28.
28. Thorax gray with a brown stripe in the middle . . . . **liberata** O. S.
Thorax brown or yellowish . . . . . 29.
29. Thorax brownish with a brown stripe in the middle . **haeretica** O. S.
Thorax brownish . . . . . 30.
30. Stigma distinct . . . . . **stigmata** Doane.
Stigma indistinct . . . . . **moniliformis** Doane.
31. Wings immaculate . . . . . 32.
Wings spotted with brown . . . . . 34.
32. No vestige of a stigma . . . . . **globothorax** O. S.
Stigma distinct . . . . . 33.

33. Stigma brownish; wings with a slight pubesence in the apical portion. **pubipennis** O. S.
Stigma pale; wings without pubesence . . . . . **cervina** n. sp.
34. Wings brownish, three or four brown spots along the anterior margin . . . . . **rara** O. S.
Wings with brown dots in all the cells . . . . . 35.
35. Markings on the wings intense; lobes of the hypopygium rather elongated and deeply incised on the inner margin. **simulans** Walk.
Markings on the wings less intense; lobes of the hypopygium not incised . . . . . **duplicata** Doane.

Dicranomyia viridicans n. sp.—Greenish; head somewhat darker above; palpi and antennae light brown; first two segments of the latter much paler; thorax and abdomen wholly brownish green; the large lobes of the hypopygium brighter green, their inner margins furnished with a strongly chitinized reddish three-pronged appendage; halters whitish; legs greenish, femora somewhat lighter towards the base; wings whitish hyaline; stigma pale; subcostal cross-vein near the tip of the auxiliary vein, which is opposite the origin of the praefurca; veins greenish; discal cell closed, three times as long as wide; great cross-vein some distance before the inner end of the discal cell. Length 5mm., wing 9 mm.

Hab.—Stanford University, Cal. One male.

Dicranomyia particeps n. sp.—Brownish yellow; head yellowish, brownish above; rostrum yellow; palpi brown, first segment yellow; antennae brown; thorax yellow with three brown stripes above; scutellum and metanotum grayish; halteres long, brownish, yellowish at the base; legs brownish, feet darker; abdomen brownish, yellowish below; posterior margin of each segment lighter; the tergum of the hypopygium somewhat tumid, with a very narrow median black line, pleura very much smaller than the tumid lobes; upper valves of ovipositor slender, arcuated, lower valves stronger, almost straight; wings long and narrow, hyaline; auxiliary vein ending a short distance before the origin of the praefurca; the distance of the subcostal cross-vein from the tip of the auxiliary vein about equal to the length of the praefurca; stigma faint brownish; discal cell closed; great cross-vein at its inner end. Length 6 mm., wing 7 mm.

Hab.—Keyport, Wash. Nine males, six females.

This species shares with *halterata* and *adjecta* the extra long

halteres. From this latter it may be distinguished by the position of the subcostal cross-vein and from the former by the body being more yellow, wings narrower and in having three brown stripes on the thorax. In *halterata* the pleura of the hypopygium are quite as large as the lobes that are appended to them, while in *particeps* they are much smaller than the lobes.

Dicranomyia adjecta n. sp.—Yellowish brown; head, rostrum, palpi and antennae darker brown; first three joints of the flagellum rather globular, others more cylindrical, all distinctly pedicellate; thorax yellowish brown; dorsal stripes faintly or not at all indicated; pleura yellowish, with a broad, brown band from the collare to the base of the halteres; halteres long, infuscated; coxae yellowish; legs tawny; extreme tip of the femora lighter; tarsi darker; abdomen brown, lighter below; basal lobes of hypopygium dark brown, lamella lighter brown; ovipositor ferruginous, blackish at the base; lower valves straight, rather heavy; upper valves more slender, slightly arcuated; wings hyaline; veins and stigma brown; auxiliary vein reaching a little beyond the origin of the praefurca, subcostal cross-vein at its tip; first longitudinal vein fading out a little beyond the marginal cross-vein before reaching the margin of the wing: discal cell closed. Length 7 mm., wing 9 mm.

Hab.—Stanford University, Cal. Two males, two females.

May at once be distinguished from *halterata*, which it resembles somewhat, by the position of the subcostal cross-vein.

Dicranomsia cervina, n. sp.—Brown; head brownish, darker above; rostrum yellow; palpi and antennae brown; thorax brownish, the dorsum with three darker brown stripes, the median one extending over the collare; scutullem and metanotum grayish brown; legs tawny, tarsi and the tips of the femora and tibiæ darker; halteres whitish, infuscated toward the tips, knobs brown; abdomen brown, much lighter below; hypopygium yellowish brown; tergum but little swollen, pleura about as large as lobes, basal half yellowish, distal half brownish; ventral style strongly recurved at the tip; wings with a very light brown tinge; stigma pale, indistinct; tip of the auxiliary vein beyond the origin of the praefurca; distance of the subcostal cross-vein from the tip of the auxiliary vein equal to one-half the length of the praefurca; discal cell closed. Length 7 mm., wing 8 mm.

Hab.—Stanford University, Cal. One male.

I have the following species from localities not recorded in Aldrich's catalogue.

D. longipennis Schum. N. H.; Wash. Not recorded from the Pacific coast heretofore.
D. citrina Doane. Stanford Univ., Cal.
D. immodesta O. S. Rigaud, Canada.
D. padica O. S. Rigaud, Canada.
D. liberata O. S. Pa.; Mass.
D. halterata O. S. Stanford Univ., Cal.; Keyport, Wash.
D. vulgata Berg. Wash.
D. stigmata Doane. Stanford Univ. and San Mateo, Cal.; Keyport, Wash.
D. marmorata O. S. Stanford Univ. and Pacific Grove, Cal.; Keyport, Wash.
D. duplicata Doane. Cold Springs, Col.; Pullman, Wash.

The Inflation of Larvae.

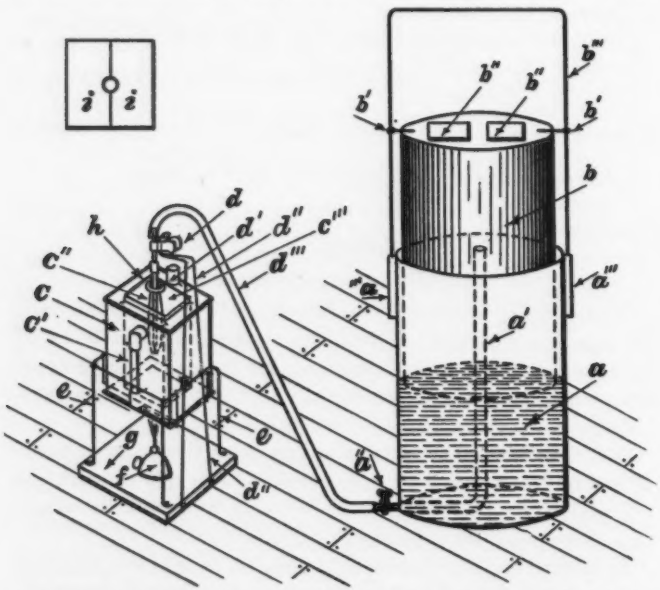
By Frank A. Merrick.

The growing interest in the breeding of Lepidoptera from the egg, working out life histories, or from the larvæ to secure perfect and authentic imagoes for the collection, emphasizes the importance of preserving the larvæ for future comparison.

The advantages of inflated larvæ over those that are preserved in liquids are manifold, possibly the chief of which is the ability to pin each species in the cabinet with its imago, thus greatly enhancing the value of the collection.

In taking up the inflation of larvæ at the Merrick Museum a few weeks ago, we found that, so far as we could ascertain, the apparatus in use for that purpose, failed to meet the important, I might say vital, factors required of such apparatus, which we assume to be—First, that the arrangement for inflation of the skin shall be susceptable of the most delicate adjustment; that it shall be instantly changeable to a greater or less pressure; that the pressure shall be constant as to force, and automatic. Second, that the temperature of the oven shall be equally controllable by the operator, and that it shall be impossible to produce a heat that shall scorch the most delicate skin, producing discoloration, or singe the hair of the

hairy forms. Third, economy of time. Fourth, economy in cost of making the apparatus. We at once proceeded to experiment with a view of devising a tank and oven that should meet these four requirement, and from old tin cans produced an oven and tank that, after Mr. Henry Engel has inflated hundreds of larvæ, from the monstrous Samais (which we



a, bottom section of tank 12 x 18 in., half filled with water as shown; *a'*, tube leading air to blowpipe; *a''*, stopcock to shut air from blowpipe; *a'''*, sockets to hold guide rod; *b*, top section of tank 11 x 18 in.; *b' b'*, screw-eyes soldered to top of *b* to slide on guide rod *b'''*; *b'' b''*, weights to regulate air pressure by adding or removing; *b'''*, guide rod, ¼ in. round iron, to keep upper tank perpendicular in center of lower tank; *c*, outer shell of oven 6 x 6 x 8 in. high; *c'*, glass gauge tube, to show amount of water in boiler; *c''*, blowpipe in position for drying larvae; *c'''*, inner shell of oven 4½ x 4½ x 7 in.; *d*, spring clip to hold blowpipe; *d'*, tube ¾ in., to fill boiler and allow escape of steam or vapor; *d'' d''*, wire support to which clip is soldered; *d'''*, rubber tube ¼ in. from tank to blowpipe; *e*, wire frame to support oven; *f*, alcohol lamp or gas jet to boil water; *g*, block to support oven; *h*, ring in blowpipe to clamp larvae; *i i*, glass cover (made in two pieces) to cover oven, allowing operator to see larvae and retain the heat.

call the "Ox Roast") to the tiniest Micro, has met all the requirements mentioned, not the least being economy of time. All the time required is for cleaning the larva and placing it on the blow pipe; you can then turn your attention to other

matters, and no harm will result if left in the oven an hour or two a day.

We shall be pleased to furnish (free of cost) a sketch of our tank and oven in detail to those interested in the preservation of larvæ, upon application, hoping thus to stimulate a more general interest in this very important branch of the study of lepidoptera.

We shall be pleased to exchange inflated or live larvæ with those interested during the coming season.

Please address Merrick Museum, New Brighton, Pa.

Annihilating the Codling Moth.*

PROF. A. L. MELANDER, Pullman, Wash.

To trace step by step the advances made in the fight against the codling moth is an instructive lesson of the importance of applied entomology. Here is a pest that for ages has rendered almost worthless a large percentage of the apples the farmer produced. The money loss to the community annually mounted to the millions of dollars, and before the days of economic entomology there was no method of checking this enormous drain. Early study by the entomologist showed the tree-descending habits of the mature worm, and gave the hint of trap bands to be placed around the trunk. These bands trapped somewhat less than one-half of the worms, but did not protect one-half of the fruit crop.

The discovery of Paris green and the invention of the spray pump added more to the crop, but the strength of the spray, the number of sprayings necessary, and the dates of their application had all to be determined by laborious experiment. In the early days of Paris green, scarcely forty years ago, it was considered an achievement to save sixty per cent. of the crop, even if a dozen sprayings were given.

Further study of the moth's life history indicated that three or four sprayings properly timed were all that were needed. Experimental applications of various insecticides showed that arsenate of lead was superior to Paris green. The advent of

* Contribution from the Zoological Laboratory of the State College of Washington.

high pressure power sprayers enabled the use of weaker sprays than had heretofore been thought desirable. By these various steps the savings mounted; eighty per cent. became ninety per cent., and then ninety-five per cent., until two or three years ago even ninety-eight per cent. could be counted on.

This past season in concluding a series of investigations on this pest that have been in progress for a number of years, the State Experiment Station of Washington eclipsed the record. Modern power sprayers, working at two hundred pounds pressure, forced a dilute spray into every flower cup. As fast as the worms entered the cups they were poisoned. The annihilation of the first brood of larvæ was almost complete. In a seventeen-acre orchard that had 400,000 wormy apples in 1906, but 176 worms were taken from the band-straps this year, indicating that but four hundred worms escaped the first spraying. Even under the best conditions of reproduction the second brood in this orchard could not have exceeded eight thousand worms or eighty boxes of apples. But, as two other sprayings were given to poison the second brood the calculated eighty boxes were reduced to six, one-tenth of one per cent. of the crop.

To give the two sprayings for the second brood cost $100, which was more than the increased saving amounted to. In other words, a single complete spraying is now considered all that need be necessary to suppress the codling moth, no matter how wormy the orchard previously was. This sentence must be read carefully, it means much more than simply spraying. It means thorough spraying, at a certain date and in a way that the fruit grower ten years ago did not dream of. The spraying must be given within a few days after blossoming time. A coarse spray is forcibly shot from Bordeaux nozzles only, drenching the tree through and through. Arsenate of lead alone is used one pound to fifty gallons, or in some of our tests even as weak as one pound to eighty gallons. The idea now is that the poison is better distributed when carried by much water thrown with great force than when used as the misty concentrated spray prevalent a few years ago. Another important point has been brought out, on which the success of

a single spray will largely depend. Previous experimenters have insisted on the necessity of spraying for the second brood if wormy orchards are near. We believe, however, that normally the codling moth breeds generation after generation in a most restricted area, that it may even be said to have a home-tree. If, therefore, all the worms in an orchard be exterminated, the chance for outside re-infection under ordinary conditions is small.

In the evolution of this fight against the codling moth, banding was first thought of. Then this was supplemented by spraying. The spraying became of most importance, and in time supplanted banding. In the development of spraying methods, the misty concentrated spray of the hand pump was replaced by high-pressure spraying, and the number of haphazard sprayings was continually cut down, until to-day we believe that a single spraying can be made completely effective if thorough and on time, the maximum saving at the minimum cost. Through the study of a few decades economic entomology has enabled the farmer to save his entire crop instead of losing all,—an unselfish investigation that has added an untellable measure to the world's good.

I WOULD be glad to get material in the Noctuid genus *Homoptera* and its allies from all parts of the country for study in the preparation of a revision of this series. I will name and return specimens promptly, for the privilege of retaining such as may be needed in completing the work.—JOHN B. SMITH, New Brunswick, N. J.

TELEA POLYPHEMUS.—This moth is quite common in California. The preferred food plant appears to be the Live Oak (*Quercus agrifolia*), a non-deciduous tree. For this reason it would be of little advantage for the pupa to fall. The foliage of the Live Oak is dense and detection of the cocoon is difficult. I have never known any other than attached cocoons from this locality. I have found several which were attached by a short silken pedicle similar to that of *promethea*. In one instance this stalk was about an inch and three quarters in length. A similar case of such a specialization is described by Grote in the Proceedings American Philosophical Society, Vol. XII, 401, 1902. Besides *Quercus*, the larva feeds on *Rosa*, *Prunus* and others. *Polyphemus* is badly parasitized here by *ichneumonid*, *tachinid*, and *braconid* flies.—KARL R. COOLIDGE.

A new Eriocrania (Lepidoptera) from the Pacific Coast.

By Francis X. Williams, San Francisco, Cal.

(Plate II)

In early March, 1905, I had the good fortune to capture several examples of an *Eriocrania* (*Eriocephala*), which Mr. Busck, of the U. S. National Museum, pronounces to be a new species. The specimens, ten in all, were caught at the base of Mt. Tamalpais, in Marin County, in a small grove of oaks (*Quercus agrifolia*). They were in good condition and captured rather early in the morning, being disturbed from the trunks of trees. Their flight is rather weak, but hard to follow on account of the small size of the insect. When taken they sometimes feign death, as is often the case in *Hepialus*, folding their wings like a caddis-fly.

Five of the specimens were dissected for anatomical study and another was accidently destroyed, leaving four specimens in good condition.

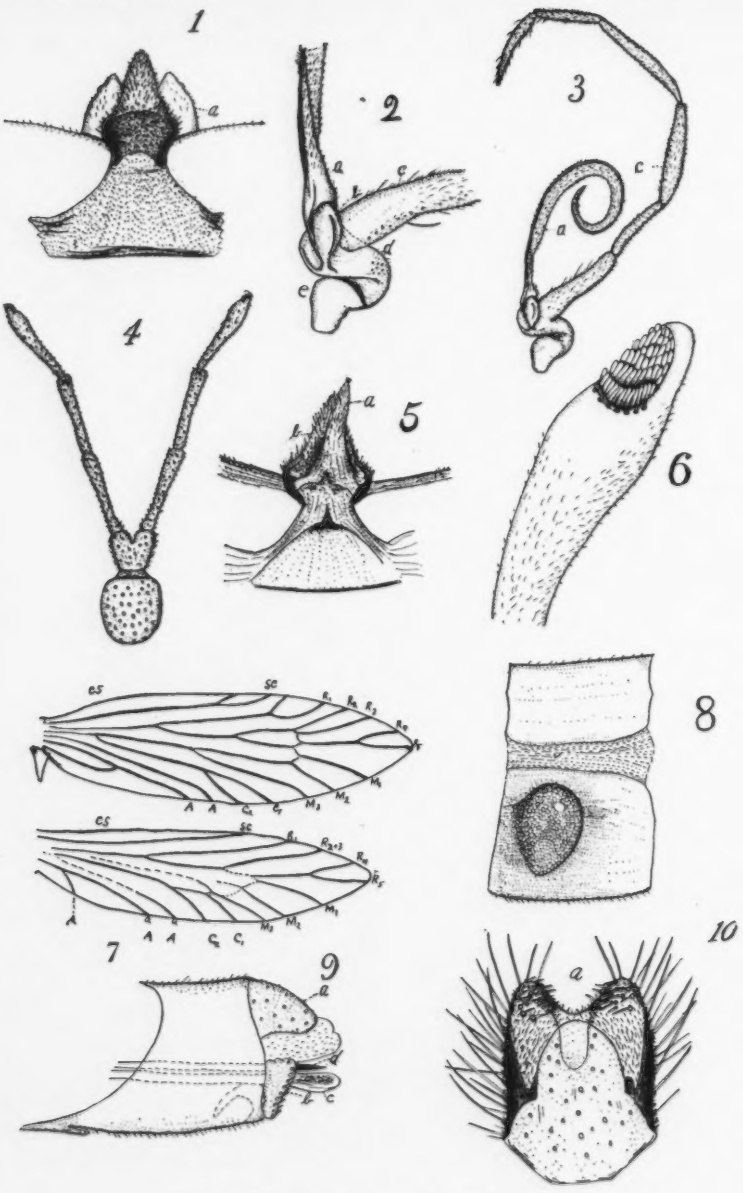
Eriocrania cyanosparsella n. sp.

Head covered with coarse, light gray hair; antennæ dark golden, more than half the length of the primaries. Primaries metallic golden with purplish patches showing rusty golden in some lights, and forming three rather irregular oblique bands across the wing, the outer extending across the base of the outer third of the wing and having a short, interior parallel band at the outer angle, the middle band diffusing costally, and being the plainest of the three; the inner band in the basal third most evident at the costa, its lower half broken and represented by one patch on the inner margin. Purple patches scattered about the apex, along the outer margin, and basally on the costa. All purple showing cyanous blue scales in certain lights. Secondaries golden, becoming translucent towards the base, outer half purplish, especially apically. A strong rusty, golden tinge is probably faded purple. Blue scales sometimes reflected. Fringes pale metallic gray, golden at their outer half on the primaries. Body more than half as long as primaries, covered with long, light gray hair. Legs elongate and spurred. Expanse 11.60 mm.

Type 1 ♂ ; Cotypes 3 ♂ ♂ , in the collection of the author.

There is some variation in the intensity and arrangement of the bands on the primaries, these being heavier in some and more numerous or less in others, but they agree with the type in fundamental pattern. The expanse varies from 10 to 14 mm.

The mouth-parts and wing venation illustrated on the plate, show well the primitive character of the *Micropterygidæ*.



ERIOCRANIA CYANOSPARSELLA N. SP.

The somewhat spatulate labrum is well chitinized for its basal half, especially laterally, and bears a number of slender scales removed in the figure, which shows the cavities into which these scales fitted. The distal portion of the organ strongly suggests an epipharynx, which, however, arises from the underside of the labrum, and is fused with the latter for some distance.

The weak and functionless mandibles are partly concealed by the labrum.

The maxillæ have the elongate curved lacinia well developed and are probably not altogether functionless, and represent the primitive proboscis. The galea is furnished with a heavily chitinized dorsal ridge. The stipes and cardo are represented by the unjointed basal portion of the maxilla.

The elongate, six-jointed maxillary palpus has an unnatural curve in the figure and should be recurved from its middle under the head.

The labium has the mentum subquadrate, and the submentum bifurcate, and bears long, slender scales. The palpus terminates in a curious structure almost apically situated. This is represented in Fig. 6 and consists of a rather oval pit from which arise a number of clavate hairs, probably having an olfactory function.

The venation is shown in Fig. 7, where it will be noticed that the jugum is quite large, and that in the fore-wing the radius is six-branched. A curious flap-like organ, possibly a secondary sexual character, is situated on each side of the sternum of segment 4 of the abdomen.

EXPLANATION OF PLATE II.

Fig. 1. Labrum, *a* mandible.
Fig. 2. Maxilla, *a* lacinia, *b* galea, *c* max. palpus, *d* stipes, *e* cardo.
Fig. 3. Maxilla, *a* lacinia, *c* max. palpus.
Fig. 4. Labium and palpi.
Fig. 5. Labrum, from below, showing epipharynx *a*, *b* labrum.
Fig. 6. Pit with clavate hairs, 3d seg. lab. palpus.
Fig. 7. Wing venation.
Fig. 8. Fourth segment of abdomen showing flap-like organ.
Fig. 9. Terminal segment and genitalia, *a* valve, *b* harpe, *d* penis, *c* penis sheath.
Fig. 10. Ventral view of valves (*a* Fig. 9).

Notes on the Orthoptera of Raleigh, North Carolina.

By C. S. Brimley.

The following notes on our Orthoptera relate chiefly to the seasonal distribution of the different species and the various situations in which they are found.

Family FORFICULIDÆ

Anisolabis azteca so far only found under stones in November. *Labia minor* attracted to lights in summer, and once found under rubbish in winter. *Spongophora brunneipennis* under bark of dead oaks in both summer and winter, nymphs also taken at the latter season.

Family BLATTIDÆ

Ischnoptera major is found in both the adult and nymphal stages under the loose bark of dead pines, both prostrate and upright, and also under the bark of stumps. It seems to prefer the space under the bark to be rather damp.

Ischnoptera couloniana is found in both stages under loose bark of upright dead pines, and only when the space under the bark is dry.

Our other native roaches, viz.: *Ischnoptera uhleriana, I. johnsoni, Temnopteryx deropeltiformis, Kakerlac schaefferi,* and *Ceratinoptera lutea* are all found under the thick covering of pine straw lying on the ground in pine woods.

The seasonal range of our native roaches appears to be much the same with all our species, viz.: from May to August, although the last four named have so far been only observed up to late June or early July.

Family PHASMIDÆ

Our three specimens of *Diapheromera femorata* were taken in September and October.

Family MANTIDÆ

Mantis carolina flies at dusk from the end of August to the middle of October. The egg masses are attached to twigs or not unfrequently to the trunk of a dead tree under the loose bark.

Family ACRIDIIDÆ

Subfamily TETTIGINAE

Tettix arenosus, Paratettix cucullatus, and *Tettigidea lateralis* overwinter in the adult form and *Neotettix bolivari* in the nymphal stages. *Tettigidea lateralis* occurs throughout the whole year, but I have not yet got sufficient data as to the others. In late fall and early spring all the forms occur in drier situations than during the hotter portions of the year.

Subfamily TRYXALINAE

Amblytropidia occidentalis overwinters in the adult form, having been taken in or close to woods from October to May.

Eritettix navicula overwinters in the nymphal stages, the nymphs being rather common in late fall, while the adults have only been taken in April and May in broom straw near water.

Our other species all apparently overwinter in the egg state and their seasonal range is about the same, viz.: from July to November. Of our four species *Orphulella pelidna* is very common in grassy places in and near pine woods, *Dichromorpha viridis* and *Syrbula admirabilis* are liable to occur in long grass almost anywhere except in the marshes, and *Tryxalis brevicornis* is strictly confined to grassy marshes.

Subfamily OEDIPODINAE

Arphia sulphurea and *Chortophaga viridifasciata* overwinter as nymphs, and all the others in the egg stage.

The two *Arphias, Spharagemon bolli,* and *Chortophaga viridifasciata* occur in grassy places in or near woods, the latter form ranging more or less commonly throughout the whole season from April to November. *Arphia sulphurea* has been taken from April to August and *A. xanthoptera* from September to December, while *S. bolli* ranges from August to November.

Our two *Hippisci* occur in grassy fields, *phenicopterus* occurring from late May to the end of July, and *rugosus,* which seems to prefer longer grass than its congener from early August to late November.

Dissosteira carolina and *Trimerotropis citrina* frequent dusty

roads and bare fields from June (*Dissosteira*) or July (*Trimerotropis*) to early December. The latter species seems to be seldom found away from roads except in the latter part of its seasonal range, and is furthermore the only Acridiid which I have noted as being attracted to lights.

Subfamily ACRIDIINAE

Leptysma marginicollis apparently overwinters as adult, and is confined to marshes except in late fall when I have collected it on dry ground among broom straw (*Andropogon*). Apparently ranges through nearly the whole year.

Of the three Schistocercæ found here, *alutacea* occurs chiefly on the uplands from early August to early October, not overwintering in the adult stage like the other two species, while *damnifica* has been taken from mid-September to late April, its habits in winter being similar to those of *americana*.

S. americana, our third species, occurs throughout the entire year, the nymphs which are dimorphic in color, some being brown and others green, transform to the adults from the end of August to the middle of October. The adults leave the fields and take to the woods during the winter and are liable to be on the wing on any comparatively warm day. In spring they leave the woods and take to the fields again, being found in May and June on crimson clover and grain; about this time the sexes are found in coitu. In July and August their numbers rapidly diminish, but old adults were brought me in September, 1907, at the same time as newly transformed specimens.

Of our *Melanopli*, *atlanis* occurs in grassy fields from June to December, an occasional specimen lingering on till January; while *femur-rubrum* only occurs from September to late November though very abundant in grassy fields at that season. The other two common species, *keeleri* and *scudderi*, occur in or near pine woods mostly, their range being from mid-August to early December, though I took specimens of the latter on January 21 and 22, 1906. Our only other form *punctulatus*, occurs in pine woods, but we have only taken four specimens (on October 9 and 19, and November 5, 1907).

Paroxya floridiana, our only other Acridiine, occurs in grassy and weedy marshes from mid-August to mid or late November.

Family LOCUSTIDÆ

Subfamily PHANEROPTERINAE

The two common Scudderiæ, *furcata* and *furcifera*, occur in woods, marshes, and to some extent in weedy fields from late August to early November, while *curvicauda* has only been taken in August and September.

Symmetropleura modesta has only been taken from mid-July to early August and the species may be arboreal, as it has been taken both at light and on sugar, but not in ordinary collecting.

Microcentrum laurifolium has been taken from late July till late September mostly on bushes and low trees. The nymphs have been taken on grape, buckeye, maple, genarium (cultivated).

Amblycorypha uhleri is found from early August to mid October among grass or tall weeds, usually in woods or partially shaded places.

Subfamily PSEUDOPHYLLINAE

The true katydid, *Cyrtophyllus perspicillatus*, our only member of this group, has been noted singing in the tops of trees, mostly oaks, from late June till late September. The few specimens that have been taken have been mostly on my back porch, where they seem to occasionally seek shelter.

Subfamily CONOCEPHALINAE

The species of *Conocephalus* have been taken mostly in long grass, but occasionally at lights in the house. Their seasonal occurrence is mostly in summer and fall, *triops* having been taken commonly from mid-August to early October, *palustris*, in marshes only, from early August till late October; *mexicanus* in both marshes and uplands, in October and May; *fuscostriatus* also in both marshes and uplands in late April, late August, and November; while our single specimen of *crepitans* was taken in my garden at dusk in August. Our only

other determined species, *bruneri,* has been taken in late July and early August, and at least one of the specimens was taken in the house at night. It would seem from the above dates that *fuscostriatus* and *mexicanus* may possibly overwinter to some extent in the adult state, or possibly as large nymphs, the latter idea being supported somewhat by the fact that I have occasionally taken large Conocephali nymphs quite late in the season. A single unknown *Conocephalus* was brought me to-day, December 7, 1907, by my little boy.

Our four Orchelimums all seem to have about the same seasonal range, mid August to late October, but while *nigripes* is found here exclusively in the marshes, and *vulgare* on the uplands, *glaberrimum* and *nitidum* are found about equally in both situations.

Of the five Xiphidii, *fasciatum* is found on the uplands in grassy fields from mid-July till early November, *ensiferum* in the same situations and in marshes, from mid-August till early November, *saltans* in the uplands from late September till early December, and *strictum* in long grass in both lowlands and uplands from mid-August to late September. Our fifth species, *gossypii,* has been taken in both marshes and uplands, but mostly at dusk on the flowering stems of the ornamental grass, *Eulalia japonica variegata,* in my garden.

Subfamily STENOPELMATINAE

Our only species, *Ceuthopilus uhleri,* has been taken under stones in woods from mid-September to late February.

Family GRYLLIDAE

Subfamily GRYLLOTALPINAE

Of our two species, *Gryllotalpa borealis* has been found mainly in burrows near water when digging for any purpose in such situations, my only recorded dates being in April and May. *Ellipes minuta* has been taken on damp, loamy soil not far from a stream, in late April and in June.

Subfamily MYRMECOPHILINAE

Myrmecophila pergandei has been taken in ants' nests under logs or under bark from late October till late March, but not yet in an ants' nest under a stone.

My single specimen of *Cycloptilus squamosus* was taken on the ground near a marsh in August, and two specimens of *C. americanus* were taken in late October in pine woods, apparently flushed from under the pine straw while I was scraping it away to look for myriapods. The male had wings and a longer pronotum, while the female was wingless, and had the pronotum shorter, but was larger than the male.

Subfamily GRYLLINAE

Of our Nemobii, *fasciatus* has been taken in open fields from early July till early December; *canus* in pine woods from early September to late November; *maculatus* in mixed woods in October and November; *exiguus* and (or) *carolinus* in damp places both lowland and upland, usually under stones or rubbish, from early September to early December; and *confusus* in damp places not far from water from mid-August to late November.

Gryllus pennsylvanicus is found in fields and woods from early April to late September, but overwinters as a nymph.

Subfamily OECANTHINAE

Oecanthus 4-punctatus is found on low plants from late June to mid-November, and *latipennis* in similar situations from early September to early November.

Subfamily TRIGONIDIINAE

Anaxipha exigua has been taken on low plants in the marshes in August and September. *Phylloscirtus pulchellus* on shrubs near water in September, and has been observed on alder, willow and cotton. *Cyrtoxipha delicatula* has been once caught in the window of my house, so it was probably attracted by the light.

Subfamily ENEOPTERINAE

Orocharis saltator has been taken on bushes in woods in September and November and once on the ground in woods in the latter month. Two well-preserved specimens were found dead under stones in December and February respectively.

Apithes agitator has been taken in woods on bushes, only in September.

Notes on the Larval Habits of Culex perturbans.

By John B. Smith, Sc. D.

(Plates III, IV)

The larva of *Culex perturbans* has eluded the search of all that have sought it up to the present time. Goeldi found a closely allied species in South America, and from the eggs secured the first stage. Beyond that he could not carry them and all died without feeding. Dr. Dyar had the same experience with *perturbans*, the first stage and egg-boat of which he secured in captivity and described. Our experience in New Jersey was not different, and in my report for 1906 I gave an account of what had been theretofore learned concerning this elusive creature.

Our experience had very greatly narrowed the scope of the investigation, by eliminating all the usual breeding places and methods of other mosquitoes and had pointed very strongly to certain permanent bodies of water containing considerable vegetation.

Perturbans is not usually a common species and the only locality from which I have annually received it in large numbers is Lahaway, in Ocean County, the collector being my old friend, J. Turner Brakeley, who has done so much to help along this mosquito investigation. He did not fail to obtain them again in 1907, and sent them in by the hundred during July. As I was unable to get to Lahaway myself, at that time, I sent Mr. John A. Grossbeck to make the hunt for me on July 31st, and accompanied by Mr. Brakeley, who pointed out the most likely places, Mr. Grossbeck found that eggs were laid in rafts on the surface of the water in densely grass or sedge-covered areas and that these boats sank readily when disturbed unless supported against a stalk or blade of grass. Sixty-nine egg boats were taken from one pool 25 x 35 feet, and others were found in similar areas. A few very young larvæ were found, but not under such conditions as to indicate their actual habits.

With this knowledge Mr. Grossbeck succeeded in locating another swamp area near Trenton, 6 or 7 acres in extent, in which egg boats were also found in some numbers.

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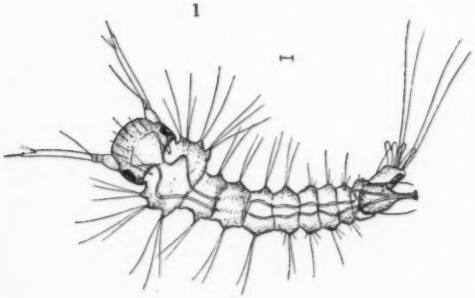

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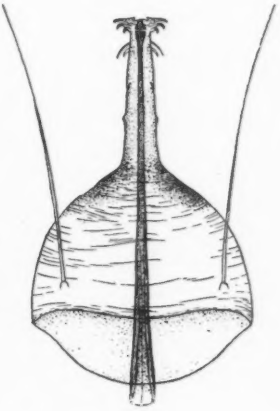

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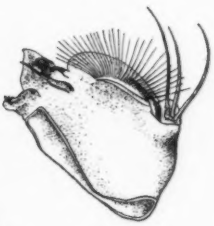

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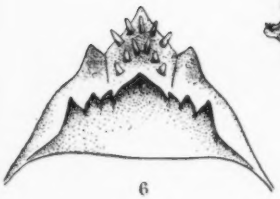

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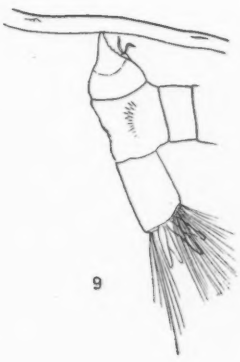

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J.A.L.

CULEX PERTURBANS

As it was considered almost certain that the larva hibernated, the matter was dropped until fall, and in September, Mr. Brakeley again began work. I had discussed the matter with him and had suggested that the insect must be attached, somehow, to some object, vegetable or animal, in such a way as to keep it permanently submerged; and so water plants were first examined, without result. Finally, on September 21st, an entire bunch of grass was taken up from the bottom, mud and all, and was washed out in a large beaker and graduate. From this several larvæ in the second and third stage were obtained and sent to me. The clue was now in hand, and Mr. Grossbeck was sent to Trenton, September 27th, and in two hours he had over forty larvæ, ranging from stages 2 to 4, and we knew just where the insects were found. Sections of sod from the swamp were brought into the Laboratory and placed in large battery jars, and soon we had over 100 larvæ under observation.

Briefly stated, the larva of *perturbans* lives in swamp areas, densely grass and reed-covered, some two to four inches below the bottom surface, and attached by the anal siphon to the roots of grasses which have a very open vascular texture. They can only be obtained by getting the net *under* the tufts of grass roots and scooping about, so as to dislodge the attached larvæ. Judging from our experience the infested areas must be covered by at least four inches of water, and when the water gets a foot deep and more open, no more larvæ are found. It is the grass-root system and not the mud that is sought, as I demonstrated at Lahaway early in November. Here the pool where Mr. Grossbeck had collected the eggs had become much deeper from late rains, and the mass of bottom vegetation had separated and was floating about 6 inches from the bottom. It was possible to break through the sod so as to get beneath it, and with a small net, to scoop along the bottom of the root-mass and from these roots I secured from one to five specimens in every trial made; but from the mud in the bottom I obtained nothing.

The life cycle of this peculiar species is not yet complete, as the pupa has not been found; but enough is known to make

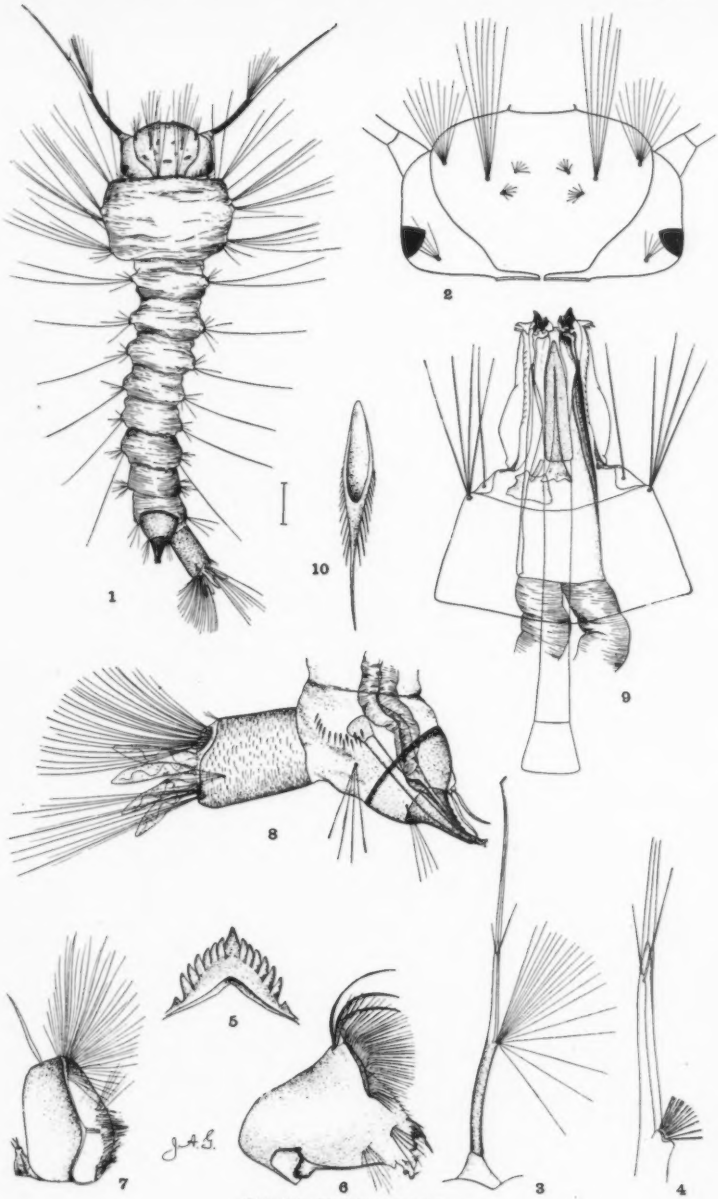
it certain that there is only one annual brood and that hibernation is in the larval stage.

Mr. Grossbeck has prepared the following description of the larva ready for hibernation and apparently in the last stage, though probably not quite full grown. The illustrations will supplement the description.

Description of the larva (Pl. IV, Fig. 1):

Length, 6 to 7.5 mm. = .24 to .30 of an inch from head to end of ninth abdominal segment. It is a robust wriggler resembling in life the larva of *Culex jamaicensis*. In color it is white tinged with a clear transparent green which is often the predominating hue. The head is pale brown, much broader than long, rounded in front and flat at the sides; four large and four small tufts of hair arise from the vertex, two of the large ones of 6 or 7 hairs each from the central portion, between which the four small tufts are situated, and one of 10 or 11 hairs near the base of each antenna. Of the small tufts the anterior pair are each composed of 6 hairs, the posterior pair of 7 each. There is also another pair of moderate sized hair tufts near the base of the head just below and inward of the eyes; these are composed of five hairs each. The eyes are remarkably small, black, and placed far down on the sides of the head. The antenna (Figs. 3 and 4) is very long and somewhat filamentous, infuscated at basal third and almost colorless beyond; a large tuft of 18 to 20 long hairs arises from an offset at the basal third and from this point the shaft is continued for some little distance apparently as a thickened side of a hollow tube which is open on one side to the apex of the main shaft; this apex is terminated by two long needle-like spines and the filamentous process has at its end a very small articulated spine. The mentum (Fig. 5) is triangular in form with a deeply excavated base and six large teeth on each side of an apical one besides a small tooth which is sometimes present near the base. The mandible (Fig. 6) presents much the appearance of that of the ordinary *Culex* (sens. lat.) type but has three curved dorsal spines and the teeth are small and situated some distance back from the apex. The maxillary palpus (Fig. 7) offers little that is peculiar, but the subapical spine is exceptionally long and blade-like and the basal process is rather small with curved apical teeth.

The thorax and abdomen are normal in form, the former with the usual number and location of long hair tufts; but the abdomen has only one tuft of two hairs on each side of the first segment, the following five each having but a single long lateral hair, while segments 7 and 8 have none except the several short hairs which are common to all segments. The eighth segment bears the lateral patches of scales,



CULEX PERTURBANS

each of which is composed of from 12 to 16 scales, arranged in an irregular, partly double row. The individual scale (Fig. 10) is lanceolate with a long apical spine and fringes of small spines at the sides. The ninth segment is somewhat variable in length, but is always longer than broad and is completely encircled by a light brown chitinous ring. The ventral brush is normal, but the dorsal hair tufts are four in number instead of the usual two. The anal gills are slightly longer than the width of the ninth segment and are supplied with obvious trachea. The breathing tube (Figs. 8 and 9) is a highly complex organ representing an extreme modification of the ordinary anal siphon. In color it is pale brown with the extreme base and apical half strongly infuscated. From a dorsal aspect (Fig. 9) it is bottle shaped* with the basal half greatly dilated. From the side the apical half curves slightly dorsally and two long blade-like spines arises from large papillæ situated on a distinct dorsal offset. The constricted portion of the tube is provided within with projecting flaps which appear to hold the inner chitinous tube in position. The apex of each lateral set of flaps is furnished with six horizontally extended hooks. The inner tube, to which the tracheæ are attached at its base, is a complicated structure in itself, being composed of several distinct pieces. A small elongate piece forms the ventral wall while another much larger piece extends curvedly from one edge to the other. From the apex of the tube thus formed extend two small tubular structures terminated at their apices by an articulated, irregular, corneous piece which, by the action of the long, somewhat chitinous piece coming from the interior of the eighth abdominal segment is capable of being thrust forward and horizontally outward. Another separate little piece on the dorsal side of the main inner tube has a serrated edge which is plainly seen from a side view of the entire siphon.

EXPLANATION OF PLATES.

PLATE III.

Fig. 1, egg-boat of *Culex perturbans;* 2, position of egg-boat on water when supported by a grass stalk; 3, young larva just out of egg; 4, antenna of same; 5, mandible; 6, mentum with hypopharnyx; 7, anal siphon; 8, lateral patch of scales; 9, method of attachment of the larva to a grass root: all more or less enlarged: original.

PLATE IV.

Fig. 1, well grown larva; 2, head, showing position of hair tufts; 3, antenna; 4, portion of same enlarged; 5, mentum; 6, mandible; 7, maxillary palpus; 8, caudal segments of larva; 9, anal siphon; 10, single scale from lateral abdominal patch; all much enlarged: original.

* The drawing was made from a balsam mount and is consequently much broader and and the outline distorted.

Notes on some Angolan Insects of Economic or Pathologic Importance.

By F. Creighton Wellman, Benguella, West Africa.

From my collecting notes on over a thousand species secured in Portuguese West Africa during the past two or three years, I have selected extracts concerning some that are useful or inimical to man, hoping that my observations may prove interesting and possibly in some degree novel. I have confined the list to a few of the more striking species. Several of the insects have been reported by me on previous occasions, and references are given to some of these publications. It is highly probable that part of the observations have been recorded before by others, as it is of course impossible to consult either books or periodicals while in West Africa. The numbers preceding the names of the insects indicate the order in which they stand in my collecting record.

1.

No. 124. *Diplognatha silicea* McL. (Coleopt.)

This handsome Cetonid, known locally as the "thatch beetle," is a great pest in a country where grass thatch is the common roofing material. *D. silicea* is a large beetle, perfectly black all over, with a beautiful jewel-like polish, as its name implies. It breeds in dry or damp grass, and almost every evening during the wet season the ♀ ♀ may be seen and heard buzzing clumsily about the eaves or top of a house. The grubs eat the thatch so that water penetrates and the roof rots in consequence. In one station their ravages were particularly annoying a few years ago, the roofs being ruined in a short time. In many places, however, the damage done is inconsiderable.

2.

No. 539. *Glossina palpalis wellmani* Aust. (Dipt.)

This subspecies is the southern representative of *Gl. palpalis* Rob.-Desv. the carrier of African sleeping sickness. The distribution of *palpalis* in Angola affords an excellent example of the effect of climate on insect life. In the hot northern districts of the colony (Congo, Ambriz, etc.) *Gl. palpalis palpalis*

only is found. In the intermediate somewhat cooler regions (Cazengo, Golungo-Alto, Ambaca, etc.) *Gl. palpalis palpalis* and *Gl. palpalis wellmani* are found side by side, while in the comparatively cool southern part of the province (Catumbella, Kubal and Cunene rivers, etc.) *Gl. palpalis wellmani* is found alone. From recent observations it appears that *wellmani* exists as far east as Lake Muero and the Dikulwe and Lufira rivers in the Congo Free State, and when sufficient additional observations are recorded they will probably prove that the fly extends right across Africa. This new subspecies of tse-tse fly has been proven to transmit human trypanosomiasis and is thus directly connected not only with the development of the country but also with the very existence of the native races. I have elsewhere published papers on the habits * and geographical distribution † of this fly.

3.

No. 635. *Phonergates bicoloripes* Stal. (Hemipt.)

This fine Heteropteron belongs to the Reduviidæ and has habits similar to *Opiscætus personatus* L. except that instead of preying on *Clinocoris lectularius, P. bicoloripes* pursues a blood-sucking tick (*Ornithodoros moubata* Murray) catching it and mulcting it of its ill-gotten food. There would seem to be no doubt that this bug preys especially on *O. moubata* as I have taken several in the act and (while I have collected many African Reduviidæ) have never seen the one in question except in native kraals, which swarm with ticks, and have never found other species sucking the ticks. While various Reduviidae will fly to light at night, yet *P. bicoloripes* is the only local species I know of which actually lives in houses. *O. moubata* is one of the most persistent and troublesome suckers of human blood in Africa, its bite being very painful, to say nothing of the fact that it transmits human spirochætosis and filariasis. So the bug under discussion would be of interest even were it not that it is itself capable of inflicting a

* Notes on the Habits of Tsetse-flies, Annals and Magazine of Natural History, Sept., 1906, p. 242.

† Neue Beobachtungen ueber die geographische Verbreitung von *Glossina palpalis* Rob.-Desv., Deutsche Entomologische Zeitschrift, Feb. 25, 1907, p. 199.

bite which is so severe that the natives compare it with that of a poisonous snake. I am elsewhere * publishing in full my notes on this interesting insect.

4.

No. 500. *Bostrychopsis cephalotes* Ol. (Coleopt.)

This species (known to the blacks as "Osekoseko") is, together with its allies, of vast economic significance. It is a wood borer which destroys most native "soft" woods, riddling them completely so that a timber will in time break of its own weight. There is an almost unlimited amount of timber in Angola that is of no value whatever because of this pest. Myriads of fine trees (*Berlinia paniculata, Brachystegia tamarindoides,* etc.) cannot be used on this account. There are fortunately a good many "hard" trees (*Pterocarpus erinaceus, Burkea africana, Balsamea mulelame,* etc.—also Ebenaceæ) which the borer does not touch. But these as a rule are more difficult to work than the "soft" kinds. I once made some experiments with this bettle. I found that boards, if sawed immediately after the tree is felled and then dipped in a long trough containing a weak solution of sulphate of copper, escape riddling. Another method is to soak them in a stream of water until they smell sour. Of course, the trouble in such procedures is that the boards warp badly for lack of proper seasoning.

5.

No. 525. *Heptaphlebomyia simplex* Theob. (Dipt.)

I have chosen this mosquito not only because it is a common and vicious blood-sucker, but also because my observations on it have a bearing on the vexed and unsettled systematic problems presented by the Culicidæ, the which are now engaging the active attention of different zoologists. *H. simplex,* which in its general facies suggests *Culex fatigans* Wied., was known previous to the writer's collections only from ♀ specimens, which differ from all other known mosquitoes by having a distinct seventh scaled wing vein, upon which character Mr. Theobald has founded a new genus and a new sub-family.

* Deutsche Entom. Zeitschrift.

From some Angolan specimens bred from eggs by the writer, however, appears the remarkable fact, already discussed by me in another publication,* that the ♂ ♂ do not share this peculiarity. In these there is no true scaled seventh vein, but the sixth is bent at right angles near the edge of the wing. This instance serves to illustrate the dangers of sweeping systematic conclusions founded upon restricted data. *H. simplex* occurs in great numbers in the rainy season, usually in company with other mosquitoes, especially *Danielsia wellmani* Theob. and *Mansonia uniformis* Theob. It breeds in foul pools, the eggs being brown in color and laid in rafts.

6.

No. 877. ?*Natada amicta* Swinh. (Lepidopt.)

It is well known that the larvæ of some Lepidoptera defend themselves by means of stinging hairs. For instance, we have *Empretia stimulea* and *Automeris io* in America. In Angola there are a number of caterpillars with this habit. Three of these are especially venomous and belong respectively to the Limacodidæ (Micro), Arctiidæ (Macro) and Liparidæ (this latter resembling rather closely the larvæ of some Tortricidæ). I have repeatedly tried to breed out these caterpillars, but have never succeeded. I have seen the Limacodid larvæ very often in spots haunted by imagines of the species named at the head of this note, and have therefore provisionally connected the two forms. This caterpillar is locally called "Epuvi" and stings terribly. I once saw a severe case of urticaria in a white child following one touch of it.

7.

No. 140. *Brachytrypus membranaceus* Drury. (Orthopt.)

This giant cricket is dug out of its burrows in mealie fields by the native women, often in great numbers. One can sometimes see small basketfuls, wings and legs removed, ready for the pot—for they are esteemed a great delicacy. Native children often go about digging for these crickets, and not seldom

* Uber einen auffallenden Sexual-Dimorphismus bei *Heptaphlebomyia simplex* Theob., Deutsche Entomologische Zeitschrift, Jan., 1, 1907, p. 19.

get their fingers badly nipped in return, as the insect's mandibles are sharp and powerful and can draw blood. When a nest of driver ants (*Annoma arcens* Westw.) goes on a raid it is a sight to see the crickets (comparatively elephantine in size) driven from their holes, stridulating indignantly and struggling in vain to rid themselves from their foes.

8.

No. 538. *Sarcophaga africa* Wied. (Dipt.)

This handsome, viviparous fly breeds in faeces, putrid meat, etc. I have elsewhere * published an account of experimental myasis which I produced in goats, using this species of fly and the allied *Sarcophaga albofasciata* Macq.

9.

No. 524. *Culex hirsutipalpis* Theob. (Dipt.)

This mosquito is not only a great nuisance but, like *H. simplex* (*vide antea*) is interesting for other reasons. The ♂ ♂ from this region differ from the type in having no pale band at the apex of the palpi, and Mr. Theobald's diagnosis of my first specimens was "*Culex sp. nov.* near *hirsutipalpis* Theob." A suite of specimens which I bred from eggs shows this sexual dimorphism to be constant and also reveals a remarkable variation in size, some individuals being a third smaller than the type. I have published some observations on the pupæ † which occur in amazing numbers at the last of the rains. The eggs are black and laid in rafts. They breed out readily in captivity. I should say before leaving this mosquito that the figure of the ♂ ungues on p. 381 of Theobald's Monograph is incorrect.

10.

No. 137. *Schistocera peregrinatoria* L. (Orthopt.)

The ravages of these pests in some parts of West Africa are almost incredible. I once witnessed the advance of the early wingless form through the Chisanje country to the east of Benguella. Hardly a green thing was left behind them. In

* Experimental Myasis in Goats, etc., Journal of Medical Research, Jan., 1906, p. 439.

† Extraordinary Number of Pupae of *Culex hirsutipalpis*, Entomologist, May, 1906, p. 116.

the adult winged state they sometimes come in such numbers as to darken the sun. The blacks may then be seen running back and forth over their plantations in the hope of saving their crops from the voracious marauders. At night these locusts (native name "Olohuma") settle on trees and shrubs, sometimes in such numbers as to almost cover them, and they may fly so closely together that a certain number break their wings by striking their fellows and therefore fall helpless to the ground. The insects are eaten by lizards, small mammals and birds, especially a sort of plover, *Glareola nordmanni*, which apparently follows and feeds entirely on locusts. The native Africans, too, are very fond of them when roasted. They also kill them by dropping them into boiling water and then dry and store them away for future use. I have found a considerable per cent. of these locusts infested with a long thin nematode embryo (*Gordius sp.*). On one occasion, too, I found enormous numbers dying on the ground. I examined a number but could not discover the cause of their fate.

11.

No. 626. ? *Drilus sp.* (Coleopt.)

A member of the Malacodermata (imago unknown) which I have repeatedly tried in vain to breed out. The larva is common, but in captivity dies without pupating. The grub is called by the natives "Ochisia," which is equivalent to *Noli me tangere!* It is greatly feared, because if one steps on it with bare feet the bristles with which it is armed pierce the thick skin of the sole and work into the flesh, causing pain, inflammation and even sloughing. One may hear a whole caravan of porters warning each other that there is an *"Ochisia"* in the path.

12.

No. 537. *Auchmeromyia luteola* Fabr. (Dipt.)

This fly (the larva of which has been somewhat unfortunately designated as the "Congo" Floor Maggot) is an important human ectoparasite, widespread in Africa, living entirely in its larval state, so far as is known, on human blood.

I have already published in these columns * an account of its life history and shall not repeat my observations here.

13.

No. 449. *Chrysobothris fatalis* Har. (Coleopt.)

This Buprestid together with others of the same family, *e. g., Sternocera feldspathica* Whit., *Steraspis amplipennis* Fabr., *Psiloptera wellmani* Kerr., etc., deserve place in this list from the fact of the wood boring habits of their larvæ; but my notes on these are not yet complete and I include the species because it (with the other three handsome species mentioned) is a common article of food among the native blacks, who also eat other beetles, notably *Zographus ferox* Har. and the larvæ of a species of *Camenta.*

14.

No. 547. *Anthomyia desjardensii* Macq. (Dipt.)

I have reported a severe case of intestinal myasis caused by this fly.† Thirty larvæ were passed by the patient, some of which were bred out and proved to be the species above mentioned. The fly, first described from the Isle of France, had not previously been convicted of causing myasis in man.

15.

No. 1025. *Dacnodes wellmani* Burr. (Dermatopt.)

This giant tropical earwig which has proved to represent a new genus and species was first brought to my attention by the fact that the blacks fear it and scramble out of its way in the same manner that they avoid scorpions, centipedes, etc. They state that the creature "bites" and is very poisonous, giving instances of serious effects from its venom. It is an interesting fact that another large earwig (*Anisolabus colossea* Dohrn) found in New South Wales is feared in the same manner by the inhabitants. I have never personally seen any one bitten by *D. wellmani,* but it is very possible that it may introduce septic matter by a bite from its powerful forceps some-

* Observations on the Bionomics of *Auchmeromyia luteola* Fabricius, ENTOM. NEWS, Feb., 1906, p. 64.

† Intestinal Myasis Accompanied by Severe Abdominal Pain, etc., American Journal of the Medical Sciences, May, 1906.

what as a species of *Mutilla* common in Cyprus (locally called "Sphalangi") is thought to convey anthrax bacilli by its sting.

16.

No. 168. *Polyrhachis militaris cupreobubescens* For. (Hymenopt.)

This ant (which is the local representative of *P. militaris* Fabr.) is to my mind the most interesting of all Angolan insects. The habits of the Driver Ant (*Annoma arcens* Westw.) have elicited much admiration, but those of the less known species under discussion are even more wonderful. These ants are a mighty friend to mankind in that they feed on termites. I once spent an hour or so watching them raid a nest of these insects. The termites were swarming, the ground about their nest being almost covered with workers and soldiers, and the winged adults were rising in great numbers. The orderly and steady advance of the ants, which were about 450 in number, was in marked contrast to the oftentimes somewhat erratic movements of *A. arcens*. On reaching the termites the ants broke order and killed the workers by crushing each one in their mandibles. The more formidable soldiers and large winged adults were seized and stung to death. Then each ant loaded its mandibles with as many termites as it could crowd into them, using both legs and tip of abdomen in the process, and the whole column filed off to their nest, the entire movement being executed with a precision and expedition that can only be compared to the manouvers of a trained body of soldiers. As the ant nests are innumerable and their raids take place often, they greatly lessen the number of destructive termites in the colony. They are rather vicious creatures, being armed with a powerful sting, the effects of which are fully as severe as those of the larger wasps. I have been stung while digging out their nests for larvæ and pupæ, and to obtain specimens of Paussidæ. The sting causes swelling, burning, itching and does not entirely disappear for a fortnight. When disturbed the ants stridulate with an angry buzzing sound almost exactly like that of water boiling in a small vessel.

(To be concluded)

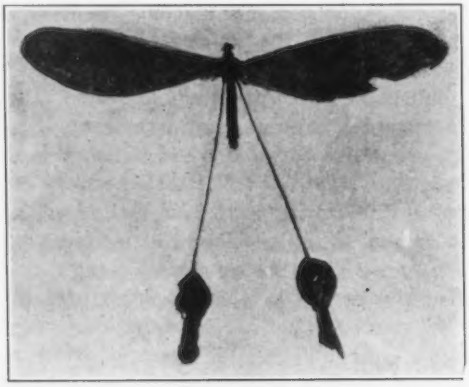
ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JANUARY, 1908.

We have selected a fossil species as the most remarkable insect made known during the preceding year. *Halter americana* was described by Prof. T. D. A. Cockerell in Science, N. S., vol. XXVI, No. 666, p. 446, October 4, 1907. We quote from the original article as follows: A wonderfully preserved example with wings spread, from the Miocene shales of Floris-



sant, Colorado. The anterior wings are clear hyaline, with venation as usual in the genus; hind wings as in all the Nemopteridae, to which family it belongs. The Nemopteridae are to-day confined to the Old World, except a single species found in Chile. This species belongs to the section of the genus containing the Persian *Halter extensa* Oliv.

It has been suggested to the NEWS that there should be a journal devoted to personal recriminations. Such a publication could be issued once or twice a year and the expense of the publication should be defrayed by the authors of the articles appearing in it. There should be no editing of any article except in so far as necessary to allow the publication to go through the United States mails. Personalities should not appear in self-respecting journals, as they do not advance science in any way, and the persons indulging in them only hold themselves up to ridicule and scorn. It is very unpleasant to reply to such articles and individuals should rise superior to the imputation that the failure to reply means acknowledgment of the position taken by the other party.

Moreover, the scientific world is not interested in disputes, as science is only advanced by the general acceptance of facts. On the other hand differences of opinion expressed in appropriate language should never cause offense. In a formative study different views are very likely to be held and should cause no friction.

Entomological Literature.

FURTHER RESEARCHES ON NORTH AMERCAN ACRIDIIDAE.—By Albert Pitts Morse. Carnegie Institution Publication, No. 68, 1907. 54 pp., 1 map, 9 pls. and frontispiece.

This extremely interesting publication is a report on the data obtained during a field trip made in the summer of 1905 under the auspices of the Carnegie Institution of Washington. On a previous trip, the results of which have been reviewed in these pages,* the author carried his field investigations through a large portion of the southeastern United States, and on the expedition of 1905 it was planned to make a reconnaissance of Tennessee, Alabama, Mississippi, Louisiana and Arkansas. However, the presence of yellow fever in Louisiana and the accompanying quarantines necessitated a re-arrangement of the work, and in consequence Indian Territory, Oklahoma and northern and "Pan-handle" Texas were examined instead of Louisiana. In all fifty-two localities were visited, of which Cheaha Mountain, Alabama, Magazine Mountain and Rich Mountain, Arkansas and Mount Sheridan, Oklahoma, may be particularly mentioned. The boreal element noted on several of these mountains, while meagre, is still sufficient to make the regions of considerable interest.

* ENTOM. NEWS, xvi, pp. 22-23.

After a general summary of the field work completed, the paper is divided into the following sections: Life Zones of Region Examined (p. 7); Humid and Arid Faunas, Dispersal, Brachypterism (pp. 7-8); Locust Coloration (pp. 8-11); Notes on Coloration and Variation (pp. 11-12); Habits, Habitats and Local Lists (pp. 13-22); Extension of Known Range (p. 23); List of New Species and Varieties Secured (p. 23); Localities at which collecting was done (pp. 23-24); Annotated List of Species (pp. 24-54).

Under "Humid and Arid Faunas" the opinion is expressed that "the transition from humid to arid conditions and fauna is gradual rather than abrupt, the borderland of the two in Texas, Indian Territory and Oklahoma being peopled by numerous genera and species of very wide....distribution, and also by some of more limited range restricted to the district between the Mississippi River and the Rocky Mountains, but occurring both in the humid and arid sections of this region." Under "Brachypterism," the author states that aside from the Tettiginæ "every flightless species of locust known from the eastern half of the continent is phytophilous, as distinguished from geophilous, in habits. This statement is in accord with the author's previously expressed view on brachypterism, but it appears to the reviewer that exception can be taken to this statement in several instances, the most striking of which are the most decidedly brachypterous and consequently flightless *Aptenopedes sphenariwides* and *Radinotatum brevipenne,* both species being at all events as terrestrial as *Spharagemon bolli,* which is considered (p. 37) a sylvan geophile.

Under "Locust Coloration" (pp. 9-10), the author gives us a much simpler and more logical argument than that presented by Vosseler to account for the brilliant coloration of the wings of certain Acrididæ. The display of the wing color is considered to be a method of "signaling, of attracting attention and thereby effecting or maintaining communication between the sexes or the individuals of a community." Under variation notes (p. 12), it is of particular interest to note that the material collected by Prof. Morse demonstrates the necessity of considering four nominal species of *Trachyrhachis* (*Mestobregma* of authors) as mere geographic races of a widely-spread species. From a type with a broad fuscous band on the wing and a lemon yellow disk to the same (*thomasi*), two intermediate forms (*fuscifrons and obliterata*) carry the gradation to a type with the wing band entirely lacking and the disk hyaline (*kiowa*). This variation is correlated with climatic conditions, the strongly colored type inhabiting the more humid regions, the hyaline type frequenting the more arid sections, the intermediates occupying intermediate areas.

The new species and varieties taken on the 1905 expedition were *Nomotettix cristatus denticulatus, Hippiscus immaculatus, Podisma australis, Melanoplus latens, M. tuberculatus, M. tribuloides, M.*

tepidus and *M. scudderi latus*. In all, one hundred and twenty-four species were secured.

In examining the "Annotated List of Species," a few records and statements call for some remarks. The record of *Telmatettix aztecus* Saussure from Mt. Sheridan, Oklahoma, is of considerable interest, as are also that of *Orphulella speciosa* from Cheaha Mountain, Alabama and *Chlocaltis conspersa* from Magazine Mountain, Arkansas. The information on *Boöpedon auriventris* is of interest, while the data on the very local and distinctly saxicolous *Trimerotropis saxatilis* are very complete, demonstrating how protective coloration is apparently a strong factor in the life of this species.

Under notes on various species of *Schistocerca* (pp. 42-44) the author recedes somewhat from his former position on the synonymy of *S. alutacea* and *rubiginosa*, admitting that in the south and west "the structural gap between the two seems to be bridged." The record of a species of *Podisma* from Cheaha Mountain, Alabama, and *Melanoplus fasciatus* from the same locality are of particular interest, while the remarks under *Melanoplus keeleri* regarding the possible synonymy of *keeleri, luridus* and *deletor* are noteworthy when taken with the synonymy of *deletor* and *keeleri* recently established by another author. We have to thank Prof. Morse for giving us an extremely important work which, with his previous one along the same lines, is absolutely indispensable to the student of insect bionomics as well as the working Orthopterist.—J. A. G. R.

MOSQUITO LIFE.—BY EVELYN GROESBEECK MITCHELL. J. P. PUTNAM'S SONS, NEW YORK AND LONDON. The Knickerbocker Press. 1907. XXII, 1-281 pp., front., illus., plates.

In this book Miss Mitchell has given the public, more especially of America, a digest of the voluminous contributions that have been made to this subject up to the present time, and in addition, some original observations and conclusions of her own that have never before been published.

The text is clear and covers all phases of the subject that are and are likely to continue to be of interest to people in general. Moreover, the numerous illustrations are destined to make clear all points that might have remained doubtful without this assistance. To indicate the scope of the work, we cite the titles of the different chapters: I. Systematic Position and Structure. II. Some Habits of the Adults. Herein the types of habits of everyday interest are fully brought before the reader and explained. III. How Far Mosquitos Fly. This momentous subject is properly given a separate chapter and here the important species are considered in regard to a phenomenon, the knowledge of which is so exceedingly useful in that it dictates what shall be the extent of extermination for the relief of a given area wherein the prevalent species of mosquitos are known. V. Larvae and Pupae. VI. Malaria. VII. Yellow

Fever and Other Diseases. In this and the preceding chapter good accounts are given of the interrelations between man, some of the lowest forms of animal life and mosquitos; also the status of yellow fever in regard to these insects. VIII. Mosquito Remedies and Enemies. Embodying the details of the most practical means toward the mitigation of the scourge and pest. IX. Notes on the Commoner Species. Wherein are set forth the cardinal features of the carriers of disease, the pestiferous forms and a few of the seemingly harmless, yet interesting species. X. Collecting and Laboratory Methods. XI. Identification Keys and Systematic List. These, the last and the next to the last, chapters have in them information of great importance in the first stage of any campaign against mosquitos. Especially worthy of note are the keys whereby the larvae may be positively determined. The key to larvae makes the book exceptionally valuable to the inspector who, in the course of his survey, cannot take time to breed out the species which he meets in the pursuit of his object—*i. e.*, the blazing the way for the practical exterminator or the health officer and the contractor. Finally, there is a bibliography which, to those sufficiently interested, opens all channels leading to the vast library on mosquitoes; an appendix entitled Mosquitoes and Leprosy, in which is reviewed the speculation on the supposed relation between these two, and a full and convenient index to the entire book.

The latest generic combinations of the species is given, also most of the synonyms—we regret in this connection to have to note the abscence of one of the synonyms of *Anopheles maculipennis*, namely *claviger*, which is current even at this late date among American doctors of medicine, in witness whereof we cite: "Plain Labels on Germ Enemies," by W. H. Thompson, M.D., LL.D. Everybody's Magazine, page 692; 1907.

All in all, this volume is a most useful one—one that will supply a very evident want. It should be widely heralded so that it may reach every intelligent person. Entomologists, doctors, health officers and, in fact, all who are interested in public welfare, can't afford to be without this latest guide, which indeed deserves to be inscribed as it is—"In Memory of James William Dupree, M. D. The true citizen, the beloved physician, the constant investigator."—H. L. Viereck.

On the W. Horn-Roeschke School.

In the Annals of the Hungarian National Museum, there has lately appeared a monograph of the Cychrini, by Dr. Hans Roeschke, purporting to include all the described species. The subject is treated on the lines of the W. Horn-Roeschke school of entomological philosophers, with its ponderous system of species, subspecies, varieties, aberrations and monstrosities, although the divine inspiration by which they are enabled to determine the status of these various subordinate forms belongs only to themselves. It appears to me that ordinary common sense would

dictate but two subdivisions of the species, as demonstrable by material at hand in our collections, the subspecies and the mutant or sport, the former including the subspecies and variety of the W. Horn-Roeschke school and the latter term comprising the so-called aberration and monstrosity, the distinction between which is surely academic. The determination of any particular form as a mutant is generally a pure guess, but this single conjecture is preferable to the two or three guesses of the school under consideration.

We may proceed at once to the discussion of several points of more or less general interest suggested by this work on the Cychrini, one of which refers to the right of a reviewer to reëstablish a specific type, the original being lost, as in the case of *Brennus ovalis* Mots. In my monograph of the genus *Brennus*, I established a new type for *ovalis*, corresponding completely with the original description and figure of Motschulsky and felicitated myself upon a happy discovery, but this fact is wholly disregarded by Roeschke, who states that *ovalis* is something else. This is a matter of principle, to be associated with the priority principle and others equally vital to the permanence of our nomenclatorial system, and I bring it forward now to test its reality among serious investigators. *Ovalis*, as I established it, is a species allied to *ventricosus*, having two anal setae in the female and is not one of the allies of *punctatostriatus*, of which *alternatus* Mots., is a synonym, the type of the latter also being lost. I believe it can correctly be maintained that the only authentic type of *Brennus ovalis* Mots., now forms part of my collection.

A certain apparent animus on the part of the author of the Cychrini monograph has led him not only into many errors of identification, but uniformly induced him to refuse me the benefit of the doubt where absolute knowledge was lacking; this is particularly evident on p. 181, where he accuses me of making three species on identical material, based upon purely individual differences. I can assure him that he is mistaken, not only as to the material being collected in anywhere near the same locality, but in the taxonomic value of the three forms, which might be considered subspecies of a single species, if one so desires, but could in no possible way be held to be synonyms by any careful investigator.* And this leads me to the most serious defect in the methods of this new W. Horn-Roeschke school, in failing to recognize the forms due to geographic isolation, by which most species have undoubtedly arisen, for it is chiefly by the study of these subspecific or incipiently specific forms

*Restricting observation to the males, for purposes of comparison, *convergens*, collected only in Siskiyou Co., Cal., has the hind body very narrow and elongate, with a more biconvex and less opaque prothorax; *opacicollis*, with relatively larger, flatter and opaque prothorax, has a very stout and broadly oval hind body; it was collected only in Oregon. *Sculptipennis*, formed nearly as in *opacicollis*, has a narrower, more shining prothorax, with the sides more sinuate toward base; it has lately been received from Mr. Fuchs, collected at Upper Soda Springs, Cal., which was probably the locality of the original Levette specimens.

that our knowledge of evolution may be substantially advanced, and their complete effacement in a taxonomic system as meaningless synonyms, is a retrograde movement that cannot live. In other words, this school aims to enhance the importance of a species, frequently to subgeneric rank, and to blot out, as far as possible, all intermediate forms. These local forms ought to be designated by name in order to admit of ready reference. I generally describe them as species, because the time is not yet ripe to assign them their true places, though the differential characters employed will generally indicate their relationships, but whether they are called species or subspecies, according to the idiosyncracies of various systematists, is wholly immaterial to me; to lump them as synonyms into a composite species with all manner of divergent modifications, which are permanent and recognizable in the several local forms, is, however, by no means calculated to increase the sum of knowledge or to afford useful data for etiologic investigation. Greater care and exercise of more perceptive discrimination in studying the forms of animal life is, with this exaggerated valuation of the species, forcing us into trinomials; it will finally result in quadrinomials if the relative importance of the species does not follow downward, and we shall ultimately lose all the benefits of the binomial system. The genera of Linné are the families and orders of to-day, and the species of many ultra-conservative writers of yesterday are becoming the genera and subgenera of more discriminating systematists.

I am rather of the opinion, after preliminary study, that the method of subdivision for the various groups of *Brennus*, proposed by Dr. Roeschke, is more satisfactory and somewhat more practical than that of Dr. G. H. Horn, which I adopted in my revision, but when the author assumes that each one of these semi-subgeneric groups represents but a single species, with an attendant retinue of subspecies, varieties, aberrations, anomalies and monstrosities, he adopts certainly a very extreme view of specific weight and, moreover, one that is very complex and confusing. The *marginatus* group alone contains some eight or nine clearly marked, true-breeding, constant and easily recognizable forms, which, according to usual custom, ought to be considered species, or some of them possibly subspecies, and the assumption, on the part of the author, that he can conclusively assign these various forms to the numerous subordinate categories adopted by the school under discussion, bespeaks a degree of self-confidence which is truly astounding. Besides, he does not make enough groups, *fuchsianus*, for example, not being assignable to any one of those defined by him, having the facies and general structure of *ventricosus*, with a single anal seta in the female and wholly isolated in some features, as in the greatly elevated thoracic margin.

The work of Roeschke on the Cychrids is a perfect replica, in method and nomenclature, of the recent papers by Dr. W. Horn on the Cicindelidae and the defects of the latter author in his mode of reasoning are fully as patent as those of the former, for one who could unite *Omus mon-*

tanus with *edwardsi* as a mere synonym, must have the sense of intellectual perception very feebly developed ; such a course could only be confusing to future reviewers and of no possible service to science, which is supposed to be an orderly and systematic statement of fact. This lapse of scientific acumen is in every way similar to that of Roeschke in suppressing the splendidly distinct *Brennus insularis* as a synonym of *marginatus*, the reduction of *symmetricus* to the status of an "aberration," whatever that may mean, the identification of *strictus* with *latipennis* Mots., the suppressing of *basalis* as a mere subspecies of *cristatus* and *Cychrus pustulosus* as a synonym of *tuberculatus*, and in reaching many other equally false conclusions, which can only serve to still more hopelessly befog the subject of specific identity in this rather difficult group of beetles.

While engaged in polemics, it may be worth while to draw attention to a recent article by Dr. J. Weise, in which he emits the opinion that I did not intend to write *Macronæmia*—a genus of Coccinellidae—but meant *Micronæmia*, and proceeds to change it forthwith, describing a new species under the name so altered. The Greek word μακρὸς, in its essential and fundamental meaning, conveys the idea of linear extension, either in space or time, and not of expansion in all directions like μέγας. In the Latin it becomes *macer*, and in English *emaciated*. In naming the genus *Macronæmia*, I intended to convey the meaning of extension, that is : it is a slender and relatively elongate *Næmia*, without reference to its size. In taking it for granted that *Macronæmia* must be a mistake and in substituting *Micronæmia* for it, Dr. Weise has merely increased the burden of synonymy, for *Micronæmia* Weise, must be a synonym of *Macronæmia* Csy. By the soundest rules it could not have been altered anyway, even though erroneous or a misprint.—THOS. L. CASEY.

ON THE BIOLOGIES OF THE RHYNCHOPHORA OF NORTH AMERICA. By W. DWIGHT PIERCE.—studies from the Zoological Laboratory of the University of Nebraska. Pp. 249-320, No. 78.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

EVE hung her wash out to dry and a caterpillar ate it.

Going to the dogs, at any rate, is no indication of degeneracy among fleas.

CHANGE OF ADDRESS.—W. E. Hinds, Professor of Entomology and Entomologist to the Experiment Station, Alabama Polytechnic Institute, from Dallas, Texas, to Auburn, Alabama.

MR. HENRY L. VIERECK, of Philadelphia, has been appointed Chief Clerk of the Division of Economic Zoology of the Department of Agriculture of the State of Pennsylvania at Harrisburg.

A REQUEST for information has been sent to the U. S. Department of Agriculture for an expert opinion as to whether it is possible for entomologists to contract osteoporosis. It is feared that the disease has affected some individuals.

"Now, children," said the teacher, "see who can make up a 'story' containing the words 'boys,' '*bees*,' and 'bears.'" The freckled boy's hand was up at once. "Well, Michael." And Michael responded: "Boys,bees bare whin they goes in swimmin'."

THE undersigned will be glad to determine Oryssidæ, Siricidæ, Cephidæ and Evaniidæ (except Gasteruptionidæ) from North America or other countries, aud will especially welcome and give credit for records of capture and distributional data in these families.—J. CHESTER BRADLEY, Cornell Univ., Ithaca, N. Y.

PREOCCUPIED NAMES OF PAN-AMERICAN ANDRENA (HYMENOPTERA).—*Andrena* (*Parandrena*) *andrenoides* var *bicolor* Rob. not *bicolor* Fabr. =*A.* (*P.*) *a.* var. *clarigastra* n. n.

Andrena salicis Rob. not Verhoff = *bisalicis* n. n.

Andrena delta Vier. not Kby. = *didelta* n. n.

Andrena indotata Vier. not *Andrena* (*Trachandrena*) *indotata* Vier = *perindotata* n. n.—H. L. VIERECK.

PROFESSOR KOCH has ascertained that there is a distinct connection between crocodiles and sleeping sickness caused by trypanosomæ. Wherever crocodiles are found the disease may be discovered, but only in places near the banks. The blood of crocodiles forms the chief nourishment of the *Glossina palpalis*, which sucks the blood between the plates of the animal's hide. The extermination of the *Glossina* is impossible, but the same end may be reached by destroying the crocodiles or by the removal of the bushes and undergrowth where the animals lurk.

AN ADDITION TO THE NEW JERSEY LIST OF BUTTERFLIES.—In July, 1900, while at Brookville, Ocean Co., N. J , I captured two (♂) Pamphilas that were new to me, and on the 30th of July another was taken at Lakehurst. The females in this species show much variation in regard to the proportion of fuscus and tawny color on the upper side. These butterflies have been shown to Dr. Skinner, who has derermined them as *Pamphila arogos* Bd. and Lec., and considers the capture of this insect in New Jersey of much interest, for heretofore it has been considered a southern and southwestern species. He adds that it only goes to prove the saying that "one can find any species in New Jersey."

I may also mention that *Pamphila aaroni* Skinner was not uncommon this past Summer at Tuckerton, N. J., and I discovered a number skipping about on the flowers growing in that always interesting zone where the upland meets the salt meadow.—WM. T. DAVIS.

TERIAS MEXICANA BDV. IN NORTHERN COLORADO.—While mounting some Lepidoptera collected by Mr. G. M. Hite and myself in the northern part of Boulder County, Colorado, I came across three specimens of *Terias mexicana* Bdv. They were collected by Mr. Hite in Copeland Park, on the North St. Vrain Creek, September 6, 1907. Copeland Park is in the lower part of the Hudsonian Life Zone, and has the altitude of about 10,300 feet.

The specimens agree in every detail with the figure of this species in Wright's Butterflies of the West Coast, except that the secondaries in one specimen are a trifle yellower. They are all males. The wings are somewhat broken on the outer margin as if they had flown a long distance.

Mr. W. G. Wright (Butterflies of the West Coast) says that, as far as he knows, *T. mexicana* has been found no place north of the Mexican border except in Arizona. Dr. Holland (Butterfly Book) says it is common in Arizona and very abundant in Mexico. Dr. H. G. Dyar (Bul. 52, U. S. Nat. Mus.), gives it from the Mississippi Valley and Mexico. Dr. Skinner (Cat. N. Am. Rhopalocera)* gives it from Mexico, and Mississippi and Colorado occasionally. Prof. T. D. A. Cockerell says it is somewhat common in New Mexico and that he has seen it at high altitudes. These localities have been given for New Mexico, Water Cañon (Snow), Mesilla Valley (Ckll.), La Cueva (Townsend), Pecos (Ckll.), and top of Las Vegas Range, 11,000 feet. (Ckll. Psyche, Nov., 1901, p. 272). Prof. D. T. A. Cockerell made this note in the Univ. of Colo. Card Catalogue: "*Terias mexicana* Bdv. (1836). This is not in Gillette's Colo. list, but I saw a light yellow *Terias* in Boulder Cañon, 7,340 feet, September 22, 1907. It could not have been anything else." From these two records from Boulder Co., in 1907, we may assume that a goodly number of this species migrated northward along the eastern foothill region of the Rocky Mts., or that they have come westward from the Mississippi Valley. To me the first seem more probable. At any rate the finding of this Sonoran butterfly in boreal, northern Colorado is a matter of no little interest.—S. A. ROHMER, Boulder, Colo.

THECLA LOKI, SKINNER.—This new species was discovered by me and a party of enthusiastic collectors July 5th, 1906, on the road between Jacumba and Mountain Springs, about 80 miles east of San Diego. The country about is practically a desert. The vegetation is composed of the common greasewood and cactus, with a little bunch of grass scattered about. There is also quite a growth of Juniper on the hills, and it is here that *loki* is to be found. He is a shy bird and keeps well to the tops of the bushes; he is swift of flight, too, and owing to the similarity of his color to that of the Juniper, correspondingly hard to take. At the time we were there it was probably late, as we only

* Supplement No. 1, gives Louisiana, Mo.; Sioux Co., Neb.; New York. Also St. Louis, Mo. (McElhose and Schwarz).

succeeded in taking one perfect specimen, which I was selfish enough to keep for my own collection. Although it seemed to be quite plentiful in this locality, I am of the opinion that it is a Mexican butterfly, and that we took it on the extreme northern edge of its range; at least it was not to be taken this year in a region of the same character in every respect, and but a few miles north of the type locality, nor has it ever been seen anywhere else on the edge of the desert. The altitude at Jucumba is about 3,200 feet, and the locality where *loki* was taken is but little over a mile from the Mexican boundary.—W. S. WRIGHT, San Diego, Cal.

Mr. Wright says, "I am not so sure that I like the name you gave it, but shall not presume to criticise. It was my intention to ask you to name it after the locality in which it was found, but it matters little so long as it has a name." I don't fancy the name very much, but I am under the impression that it is difficult to get names. Linnaeus certainly had an easy time of it in respect to names and some people (see Proc. Brooklyn Ent. Soc.) seem to think that any names that fall short of the Linnaean standard should not be used. Oh, for some one who loves to be of use to others and who will supply appropriate names! Let us have about a thousand published in the NEWS pro bono publico. Happiness, by universal consent, seems to consist in doing good to others, so here is an opportunity. *Loki* was the god of strife and spirit of evil, who contrived the death of Balder. Afterwards he was chained, and will continue so till the twilight of the gods. The locality I had was Mountain Springs.—HENRY SKINNER.

AN OLD RECORD OF OBSERVATIONS ON THE HABITS OF *Anabrus*.—In December, 1904,* Prof. Gillette published an article on the mating habits of *Anabrus simplex*, in which he described a peculiar sac-like object which is ejected by the male at the time of copulation and carried about for some time by the female. A year later Mr. Snodgrass makes the same observation on *Peranabrus scabricoltis*, a related species.† The ejection of this sac-like object, called "sperm-sac" by Gillette, is not confined to the Decticinæ as I have seen a similar object carried by *Scudderia*.

It has been supposed that these observations were new, Gillette thanking Mr. Marlatt for having had a thorough search made in the library of the Bureau of Entomology for such references and stating that Mr. Banks, the librarian, found nothing upon the subject. Such observations had, however, been made and published almost half a century before.

In an article entitled "Exploration in Upper California in 1860, under the auspices of the Smithsonian Institution," published in the report of the Smithsonian Institution for 1864, Capt. John Feilner writes of what he

*Ent. News, vol. XV, p. 321-324, pl. XIX (1904).

†Journ. N. Y. Ent. Soc., vol. XIII, p. 74-82, pl. 1-11 (1905).

calls the grasshopper, but which is very certainly *Anabrus simplex*. He says: "These insects were first seen by me in Pitt river valley during the Summer of 1859, and in such numbers as actually to cover the ground. * * *

The insect deposits the eggs by making perpendicular and oblique holes in the ground, to the depth of an inch, by means of its tail, which is shaped like a bayonet, and is hollow. The eggs are passed from the ovary into this tail and are dropped one by one into the holes. * * * It appears to have no particular food, but feeds upon all kinds of vegetation; it will eat the dead and crippled of its own kind, but I have never observed them destroy one another. * * * Immediately before uniting sexually, the insect without the tail (which I presume to be the male), utters a shrill whistling sound, as if to call his mate. The sexual act lasts about one or two minutes, and the peculiarity I observed at this union was, that the one I presume to be the female was over the male, instead of the reverse. After the act a small bag—evidently the ovary—is attached to the body of the female close to the tail; this is extracted from the other without the tail; after a while the bag disappears. * * *"

These observations of Capt. Feilner, who was killed by the Indians soon after making them, agree quite exactly with those of recent writers. —A. N. CAUDELL.

LIST OF ODONATA TAKEN BY DR. HENRY SKINNER, IN CARR CANYON, HUACHUCA MOUNTAINS, ARIZONA. Ten species as follows:

1. *Argia* sp.

2. *Argia* sp.

3. *Ischnura demorsa* Hagen. Taken in Arizona by Morrison, and at Tucson by Kunze, in some abundance. Both records in Biol.-Cent. Am.

4. *Erpetogomphus compositus* Hagen. Previous Arizona records are from Bright Angel (Schwarz & Barber), Phœnix (Kunze), Florence (Biederman) and by Morrison.

5. *Cordulegaster diadema* Selys. The only previous record for U. S. is Bright Angel, Ariz. (Schwarz & Barber). The species extends to Cuernavaca and Orizaba in Mexico.

6. *Oplonaeschna armata* Hagen. The only previous U. S. records are Reef (Biederman) and "Arizona" by Morrison. The species extends south to Guatemala.

7. *Pseudoleon superbus* Hagen. First record for U. S. Abundant and characteristic species for Mexico and Guatemala and Lower California.

8. *Pallothemis lineatipes* Karsch. Originally described from Brazil. There are Morrison specimens from Arizona.

9 *Pantala flavescens* Fabr. The most cosmopolitan of all dragonflies.

10. *Sympetrum corruptum* Hagen. A common species throughout western U. S. and Mexico.—BY P. P. CALVERT.

Doings of Societies.

At the meeting of the Feldman Collecting Social, held on November 20th, 1907, at the residence of Mr. H. W. Wenzel, 1523 S. Thirteenth Street, Philadelphia, there were ten members present, and Mr. John A. Grossbeck, visitor.

Professor Smith spoke about *Culex perturbans* and its habits. This is a species which for three or four years last past has been hunted by all those interested in mosquito work; but not until this year were the habits of the larva ascertained. The first stages of the larva had become known from eggs obtained from gravid females; but what became of them after they got out of the eggs nobody knew.

Briefly stated, the eggs are laid in a raft on the surface of the water in densely overgrown swamps, illustrations of which were shown. The young larvæ hatching from these eggs at once make their way through the water to the mud surface and through the mud surface among the root mass below. Among these roots, anywhere from 2 to 4 inches below the bottom, the larvæ attach themselves by their anal tube and remain concealed from all ordinary natural enemies and in territory where no other mosquito larvæ can breed. The air supply seems to be obtained chiefly through the vascular system of the plants which is very loose and open.

Mr. Grossbeck, in supplement, explained how he had found the breeding places by hunting egg boats, of which he finally found large numbers, at Lahaway, in Ocean County, and at Trenton, in Mercer County. He further described the particular character of the plants among which the larvæ are found and told how he collected them by forcing the net below the grass tussocks and, by disturbing the larvæ attached to the roots, got them into the free water, where he could get them with the net.

Mr. Kaeber exhibited several species of Coleoptera and Lepidoptera, which he collected in Arizona in the past summer, which showed remarkable mimicry, and stated that the beetles and moths were taken at the same places and time, and in some cases were beaten from the same trees.

FRANK HAIMBACH, *Secretary.*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted, by purchase or exchange, Bibliog. Amer. Econ. Ent., Part 4, in good condition.—E. A. Klages, 82 Belvidere Street, Crafton, Pa.

I am desirous of acquiring by purchase or otherwise the rarer species of North American as well as exotic Endomychidae, also all literature (particularly papers by Crotch, Horn, LeConte, etc.) relating to the family not in my possession.—L. B. Walton, Kenyon College, Gambier, Ohio.

Wanted—Cocoons and pupae for cash or in exchange.—American Entomological Co., 55 Stuyvesant Ave., Brooklyn, N. Y.

I am desirous to send interesting "Lamellicornia" from Ecuador. I would like identified species in exchange.—Prof. Francisco Campos R., Guayaquil, Ecuador (Apartado No. 484).

Wanted to Exchange—Missouri butterflies with collectors in the north, east, south and west.—Aug. Knetzger, 3822 McDonald Avenue, St. Louis, Mo.

I will exchange a fine selection of Missouri *Catocala* for others, from other States.—Ernst Schwarz, 6310 Newstead Ave., St. Louis, Mo.

I have *P. modesta, H. chersis, H. luscitiosa, P. achemon, A. bicolor, A. angelica. At. jorulla* pupae to exchange for *P. pandorus. Dar. versicolor, Cal. astylus* and other North American pupae.—V. Musil, 1118 So. Trumbull Ave., Chicago, Ill.

Lepidoptera.—I have for exchange bred specimens of *Papaipema nitela, nebris, frigida, imperturbata, cataphracta, impecuniosa, marginidens, Nonagria. oblonga* and *Achatodes zaea.* Would like specimens of same genera.—F. E. Moeser, 238 Guilford St., Buffalo, N. Y.

I have one copy of Baron de Rothschild and K. Jordan's "Classification of Sphingidae" (part 57, Genera Insectorum), with beautiful plates. Will exchange same for North American moths.—G. Chagnon, P. O. Box 186, Montreal, Can.

I have for exchange Chrysalids of *Regalis imperialis, hylaeus, modesta, ajax, troilus, cresphontes, andria* and eggs of *Catocala piatrix, vidua* and perhaps others. Wish *Catocala* eggs and imagoes.—R. R. Rowley, Louisiana, Mo.

Wanted *Pachybrachys.*—I am trying to unsnarl the species of this genus and need much larger series than I now have. I will buy specimens from any part of North America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted for cash or exchange.—Large and showy North American insects of *all orders*, beneficial and noxious insects, specimens illustrating life histories.—Write to Dept. Natural Science, The Kny-Scheerer Co., 225-233 Fourth Ave., New York.

Lepidoptera for exchange. Would like Californian species not in my collection.—Erval J. Newcomer, Palo Alto, Cal.

Lepidoptera.—Pinned, in papers, complete data, in perfect condition for exchange. Would prefer to exchange for living pupae.—J. Russell, Digby, Nova Scotia.

Wanted for cash or exchange.—Bull. U. S. Div. of Ento. (old series), Nos. 1, 5, 8, 9, 10, 26, 23. J. A. Lintner's New Jersey Reports, Nos. 3-13, Illinois Reports, Nos. 14-20, Missouri Reports, Nos. 7-9.—E. F. Hitchings, Waterville, Maine.

Lepidoptera for Exchange.—*Catacola badia, antinypha, praeclara,* pupae of *luna, io, imperialis, cecropia* and *polyphemus.*—Jacob Duelks, Box 317, Stonington, Conn.

Luna Cocoons.—I have a number of living *luna* pupae of other North American Lepidoptera or papered Lepidoptera new to my collection.—B. R. Bales, M D., Circleville, Ohio.

I have pupae of *Lapara coniferarum* and *Cith. regalis* to exchange for *Theclas, Lycaena* and *Chrysophanus* not in my collection.—H. H. Brehme, 74 13th Ave , Newark, N. J.

I have pupae of *Papilio turnus* and *cresphontes, Sphinx luscitiosa, chersis, Ampellophaga myron, Triptogon modesta, Paonias myops, Smerinthus geminatus, Ceratomia undulosa* and *P. guinquenmaculata.* Want other pupae in exchange.—John Kytlica, 1347 So. Scoville Ave., Oak Park, Illinois.

Geometridae wanted, named or unnamed, particularly from the Northwest, Arizona, Montana, Idaho, North Carolina, Texas and Florida. Write first giving quantity and price. Will buy or exchange. Wm. H. Broadwell, 209 Plane St., Newark, N. J.

Would like to exchange 80 named species, many specimens of European Coleoptera (many nice sp. Carabus, Calosoma, etc.), for 50 named sp. of Coleoptera from western states.—C. Harnach, 527 W. 16th Street, Chicago, Ill.

A few pairs of that interesting beetle *Ignotus aenigmaticus* Slosson for any of the following Cremastochilus 5913, 5915, 5916, 5917, 5918, 5919, 5921, 2924, 5928.—L H. Joutel, 164 E. 117th St., New York,, N. Y.

Cocoons of *T. Polyphemus* and *Samia promethea* to exchange for *Samia cynthia Attacus crizaba* or others.—J. J. Henneberger, 10114 Ewing Ave., Cnicago, Ill.

Wanted. North American Diurnals, Spingidæ and Catocalæ. Offer in exchange large variety of European Lepidoptera.—J. McDunnough, Berlin, W. 30, Motzsh 6, Germany.

Wanted. Named or unnamed Elateridae and Buprestidae from all parts of North America. Will give named Coleoptera in exchange.—C. O. Houghton, Delaware College, Newark, Delaware.

I wish to exchange Chrysalids of *E. imperialis, P. ajax. troilus, turnus, D. hylaeus* and many others for exotic material.—G. H. Hosenfelt, 3656 Salena St., St. Louis, Mo.

Pupae of *Papilio ajax and troilus* for exchange, also a few specimens of *Anthocharis Pima and Stella,* from Arizona, Imagos.—N. Weil, Calhoun, Ky.

Lepidoptera for exchange from 1907 with data and identified. Also chrysalids of *P. turnus, cresphontes* and *troilus.*—F. Walkmus, 4398½ Tibson St., St. Louis, Mo.

Will collect in any order and supply European material in exchange for Lepidoptera, especially cocoons and pupae.—J. W. H. Harrison, 181 Abingdon Rd., Middlesboro, England.

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The following Arizona Coleoptera:—*Amblychila baroni*, 4.00; *Cicindela pimeriana*, .25; *C. arizonensis*, .25; *C. vulturina* (brown form), .40; *C. santaclarœ*, .40; *C. hornii*, .50; *Pasimachus mexicanus*, .75; *Chalcolepidius rectus*, .75; *C. snowi*, .75; *C. simulans*, .75; *C. arizonicus*, .75; *Elytroleptus ignitus*, .75; *Stenaspis verticalis*, .50; *Monilema gigas*, .40; *Oncideres tessellatus*, .75; *Leptostylus yuccæ*, 50.; *Urodera crucifera*, 20; *Nodonota arizonica*, .25. Also the following Arizona Lepidoptera: *Lemonias zela*, .25; *Eudamus epigona*, .50; *Oxycnemis advena*, .50; *Ptychoglene phrada*, 1.00; *Catocala desdemona*, 1.50; *Acontia alata*, .40; *Spragueia plumbifimbriatus*, 25; *Hatima zethus*, .75; *Triprocris rata*, .30; *Gingla latercula*, .75. Ten per cent discount on orders exceeding $10.00. Complete lists of North American insects of all orders for sale, or exchange furnished on application.

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